



E-CYCLE WISCONSIN 2024 REPORT

Wisconsin DNR annual report to the Legislature and governor
under s. 287.17(10), Wis. Stats.

May 2024



60
FREE COLLECTION EVENTS
IN 39 COUNTIES



400
MILLION POUNDS
COLLECTED SINCE 2010



872
COLLECTION SITES
IN ALL 72 COUNTIES

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Top: Portage County 2023 collection event. Photo courtesy Portage County.

Middle: Green Lake 2023 collection event. Photo courtesy Elite Energy Distribution.

Bottom: Dane County Clean Sweep collection site. DNR photo.



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Executive summary

Wisconsin's electronics recycling law has produced many successes since it took effect in 2010, recycling more than 400 million pounds of electronics and expanding electronics recycling access for state residents. Most electronics collected under the manufacturer-funded E-Cycle Wisconsin program are processed in the state, contributing to capital investments and job growth at high-tech recycling facilities.

Successes for program year 14 (July 2022 to December 2023) include the following:

- Registered collectors took in 28.8 million pounds of electronics, or 4 pounds per Wisconsin resident.
- Nearly all electronics collected under E-Cycle Wisconsin were processed initially in Wisconsin and other Midwest states. Wisconsin recyclers accounted for 70% of weight processed.
- The number of registered collection sites and events was the highest ever, even when accounting for additional collection events during the 18-month program year.
- For the first time, all 72 Wisconsin counties had at least one registered collection site or event. There were at least 60 free, one-day collection events in 39 Wisconsin counties that were open to all county residents or had no residency restrictions. There were also permanent collection sites accepting all eligible electronics for free from all residents in seven counties.
- The Department of Natural Resources awarded more than \$135,000 to 29 projects in 18 counties located mostly in rural areas, under its E-Cycle Wisconsin Electronics Collection Site Grant program, which funds electronics collection in underserved communities. These projects supported development of three permanent collection sites in Kewaunee and Pepin counties, and 30 one-day collection events between August 2022 and May 2024.
- The majority of manufacturers met or exceeded their recycling targets, despite an overall shortfall in weight collected compared with targets.
- A 2024 DNR survey found nearly all households that disposed of TVs, computers or cellphones recycled or reused them, with few putting their devices in the trash.
- Nearly all manufacturers, recyclers and collectors are complying with the law. A new administrative rule (effective July 2023) created a more level playing field among program participants and helped reduce the risk of future taxpayer-funded cleanups of mismanaged electronics.

Addressing program challenges

In conversations with the DNR over the past several years, E-Cycle Wisconsin participants have praised many aspects of the law, but noted several areas of concern. These include:

- a lack of affordable, convenient recycling in some areas;
- gaps in consumer awareness about the need to responsibly recycle electronics;
- a need for more actions to deter bad actors;
- economic and safety issues the changing material stream has brought to collectors and recyclers, especially due to fire risk from lithium-ion batteries; and
- the disconnect between sales-based manufacturer recycling targets and the weight of electronics being recycled.

In 2022 and 2023, the DNR worked to address some of these concerns through implementation of its E-Cycle Wisconsin Electronics Collection Grant Program, authorized by a 2021 law; expanded outreach efforts; implementation of an administrative rule to set standards for proper management of e-waste; and conversations with stakeholders that resulted in a March 2024 update to the E-Cycle Wisconsin law, including a new method of calculating manufacturers' annual recycling targets.

Recommendations for potential legislative changes

The electronics recycling law directs the DNR to examine several aspects of E-Cycle Wisconsin within the annual report and make suggestions for possible changes. Continued evolution in consumer electronics will present challenges unless the program can be made more adaptable and flexible. The following is a list for the Legislature's consideration, based on stakeholder input, of changes that could be made to improve the electronics recycling law and ensure its continued effectiveness.

- To make it easier for the DNR and manufacturers to determine whether the law covers newer devices and improve proper management of newer problem components, such as lithium-ion batteries, the Legislature could update and clarify device definitions, and could grant the DNR authority to update the list of covered electronic devices by rule.
- To reduce the risk of injuries, deaths and significant property damage due to fires caused by lithium-ion batteries that power many of today's electronics, the Legislature could consider expanding the list of covered electronic devices and/or eligible electronic devices under E-Cycle Wisconsin, and could also provide funding for waste facilities to install or upgrade fire detection and suppression equipment, including systems that monitor 24 hours a day for fires.

Introduction

Wisconsin's electronics recycling law establishes a statewide program to collect and recycle certain electronics. Under this product stewardship-based law, manufacturers of TVs, computer monitors, desktop printers and similar devices must register with the DNR the brands they sell to Wisconsin households and schools. Those manufacturers also must recycle a target weight of electronics each year based on their sales. Manufacturers contract with state-registered recyclers and collectors to meet their targets. This manufacturer-funded recycling program is called E-Cycle Wisconsin. The law also bans landfill and incinerator disposal of many electronics.

This report fulfills the annual reporting obligation in s. 287.17 (10), Wis. Stats., which specifies several metrics on which the DNR must report to the Legislature and governor. These include the weight of electronics collected and other information provided by program participants, an outline of electronics recycling outside of E-Cycle Wisconsin, a summary of compliance and enforcement actions related to the electronics disposal ban, and suggestions for changes needed.

The report primarily covers E-Cycle Wisconsin's program year 14, which was a "transition year" to align E-Cycle Wisconsin program years with calendar years and ran from July 2022–December 2023.

Several developments in the past two years are helping to address electronics recycling challenges and policy recommendations the DNR has identified in previous reports.

- A grant program authorized by 2021 Wisconsin Act 79, the E-Cycle Wisconsin Electronics Collection Grant Program, has expanded access to electronics recycling by supporting collection events and sites in 18 mostly rural counties.
- Registered manufacturers greatly increased their financial support for electronics collection and recycling during program year 14, sponsoring dozens of free collection sites or events around the state, including in underserved areas. This support made it much cheaper and easier for many Wisconsinites to recycle electronics, especially TVs.
- New rules that took effect in July 2023 expanded the list of devices households and schools can recycle through E-Cycle Wisconsin to include cellphones, video game consoles, and battery-powered phone and video game accessories. It also set minimum standards for electronics collection and

recycling that will help protect human health and the environment. The changes will also reduce the likelihood of future costly, taxpayer-funded cleanups of mismanaged electronics.

- Bipartisan legislation signed in March 2024 (2023 Wisconsin Act 108) updated the manufacturer recycling target formula so that targets are tied directly to the weight of electronics recycled through E-Cycle Wisconsin, rather than the weight of new electronics sold, addressing a longstanding DNR recommendation. The law also expanded the list of devices eligible to be recycled through E-Cycle Wisconsin to include video display device peripherals.

The DNR continues to engage with program stakeholders and the public to get feedback on challenges facing E-Cycle Wisconsin and potential solutions. Input from stakeholders contributed to the sections of this report concerning current challenges and opportunities for addressing them.

Program participation

Table 1 shows program year 14 (July 2022 through December 2023) registrations, and Figure 1 illustrates registration trends over time. Recycler registrations increased from 21 to 23, with nine of the 20 active recyclers (recyclers that processed eligible electronics during program year 14) located in Wisconsin. The number of registered manufacturers and brands increased slightly, thanks to increased DNR compliance work.

Table 1: Program year 14 registration and participation

Category	Registered	Active
Collectors	154	145
Recyclers	23	20
Manufacturers	157	n/a
Brands	233	n/a

“Active” means a collector that sent electronics to a registered recycler or a recycler that received electronics from registered collectors.

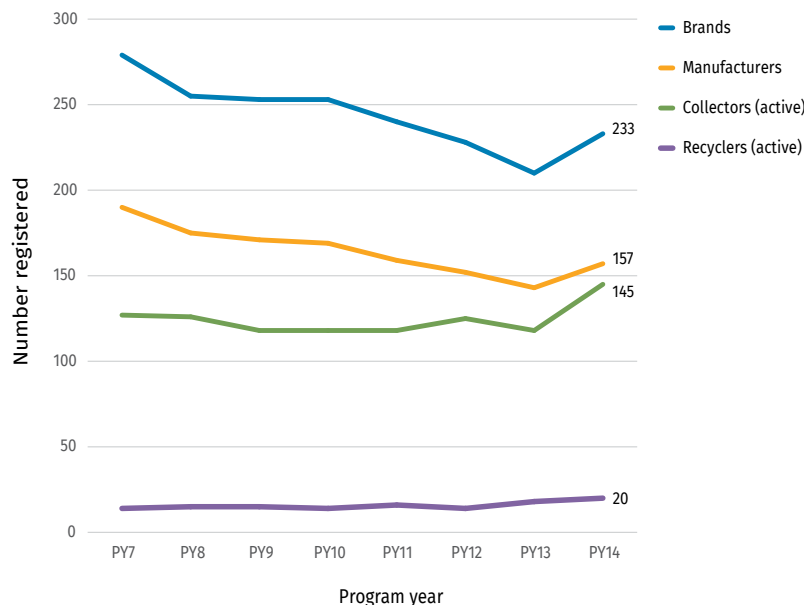
The number of registered collectors that actively collected eligible electronics—including local governments, retailers, other for-profit businesses and non-profits—increased from 118 in program year 13 to 145 in program year 14. This was largely due to increased support from manufacturers for collection site and recycling costs.

As shown in Figure 2, the number of registered collection sites increased dramatically, with 872 total permanent sites, one-day events and other temporary sites, compared with 577 in program year 13. The increase was due in part to an 18-month program year

allowing time for more one-day collection events, but the DNR grant program and manufacturer sponsorships led to more events than usual. There were also 40 more permanent collection sites registered during program year 14.

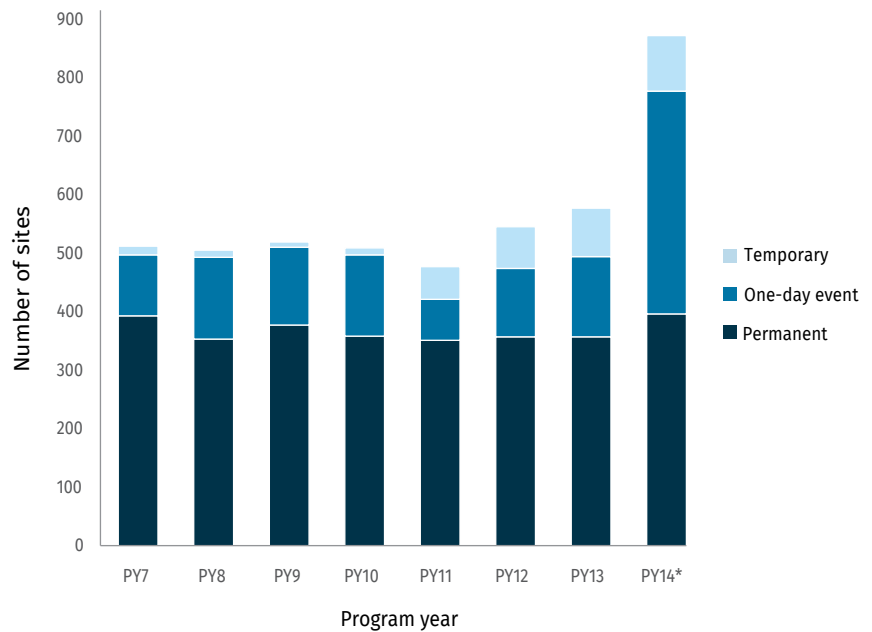
During program year 14, there were E-Cycle Wisconsin collection sites or events in all 72 Wisconsin counties, thanks primarily to the DNR’s E-Cycle Wisconsin Electronics Collection Grant program. Nine counties only had collection events that were open to all residents.

Figure 1: Summary of E-Cycle Wisconsin registrations



Three other counties (Chippewa, Dunn and Langlade) had collection events open to all residents and a permanent site open to all residents that did not accept TVs. One county (Iowa) only had events open to residents of specific municipalities, and one (Price) had only a collection site limited to residents of a specific town. The map in Appendix A shows counties that had at least one permanent collection site or one-day collection event open to all county residents and accepting all eligible electronics during program year 14.

Figure 2: Registered collection sites over time



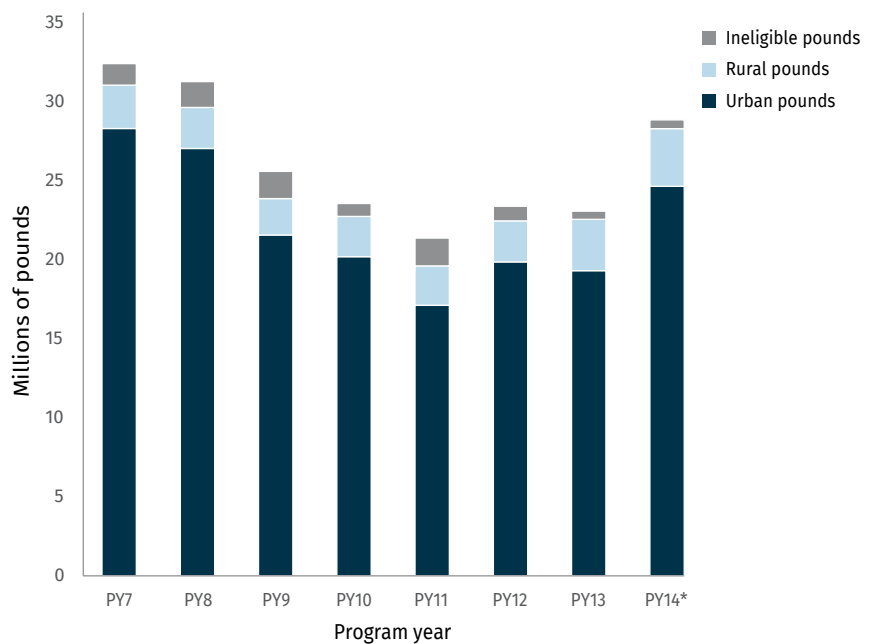
* PY14 was 18 months.

Collection and recycling totals and analysis

Collectors, recyclers and manufacturers report weights of electronics collected and recycled from counties designated as “urban” or “rural” under Wisconsin’s law. The map in Appendix B shows which counties are designated as urban and rural.

From July 2022 through December 2023, registered collectors took in 28.8 million pounds of electronics from Wisconsin households and schools (see Table 2), or just under 4 pounds per capita.

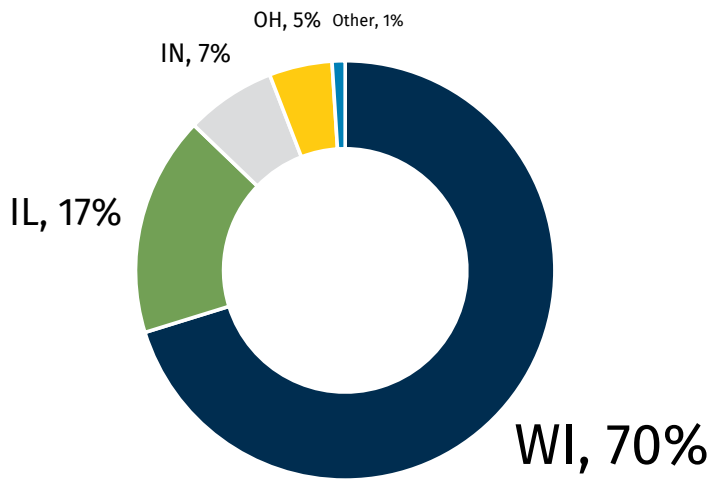
Figure 3: Pounds collected by registered collectors



* PY14 was 18 months. “Ineligible pounds” means pounds that would have been eligible for manufacturer credit if sent to a registered recycler, but that collectors dismantled themselves or sent to a non-registered recycler.

As shown in Figure 3, the weight of eligible electronics collected increased from program year 13 to 14. Since program year 14 was 18 instead of 12 months, adjusting the PY14 collection to a 12-month equivalent would show a decrease, from 23.1 to 19.2 million pounds. The ineligible weight dismantled by collectors or sent to non-registered recyclers increased from approximately 516,000 in program year 13 to 561,000 pounds in program year 14 (though the 12-month equivalent would be 374,000 pounds).

Figure 4: Percent of pounds received by registered recyclers, by state, program year 14



Wisconsin recyclers processed 70% of the total weight recycled during program year 14. Essentially all electronics collected under E-Cycle Wisconsin continue to be processed in the Midwest (see Figure 4).

With the rural credit (1.25 pounds counted toward manufacturer targets for each pound collected in a rural county) included and non-recycled pounds subtracted, Table 3 shows 29.2 million eligible pounds available for purchase by manufacturers—to fund the

Table 2: Pounds collected by registered collectors, program year 14

Type	Pounds
Eligible urban	24,649,952
Eligible rural	3,643,035
Dismantled by collector	81,008
Sent to non-registered recycler	479,986
Total collected	28,847,672

recycling of the electronics—in program year 14.

Manufacturer recycling targets and programs

The overall manufacturer target, set by a statutory formula that uses manufacturer-reported sales of covered devices in Wisconsin, was 44 million pounds for the 18-month program year 14, up from 24.6 million pounds in program year 13. The sharp increase in targets was due largely to higher sales during the pandemic.

Table 3: Pounds reported by registered recyclers, program year 14

Type	Pounds
Urban	24,649,952
Rural	3,643,035
Rural credit	835,892
Diverted for reuse	(9,437)
Available for manufacturers	29,186,140
Sold to manufacturers	(29,186,140)
Not sold to manufacturers	0

Figure 5 shows manufacturer recycling targets and weight manufacturers purchased from recyclers to meet their targets. It also illustrates the gap between pounds recycled and pounds paid for by manufacturers in the years before program year 11. Due in part to COVID disruptions in 2020 and in part to increasing manufacturer targets combined with fewer heavy TVs being recycled, the weight recycled during program years 11-14 was less than the overall manufacturer target.

Based on information submitted on annual reports and discussions with stakeholders, most manufacturers rely on recyclers or group plan managers to find and/or set up collection networks. Prominent exceptions include the Dell Reconnect program, in which Dell works with several networks of Goodwill stores; Best Buy’s in-store and haul-away collection programs; and Apple’s recycling program for schools. During program year 14, several manufacturers directly sponsored dozens of collection sites or events, many of them free to residents.

Rural credit is 1.25 pounds per pound collected.

During program year 14, 49 manufacturers participated in collectives—similar to “group plans” in other states—that contracted with recyclers for a large total sum of pounds and distributed the pounds among their members. These collectives were responsible for about 49% of pounds purchased by manufacturers.

Most manufacturers continued to meet their sales weight-based recycling targets in program year 14. Twenty-five manufacturers recycled more than their targets and therefore earned credits that can be used during the next three program years (see Table 4), though all but one of them earned less than 1 pound. Twenty-three manufacturers used just over 160,000 credits from previous years to meet their targets. At the end of program year 14, just over 14,000 credits were available to manufacturers for future use, the lowest total in program history.

Each year, the DNR encourages manufacturers to purchase eligible recycled pounds rather than pay a shortfall fee, but some with very small targets have said it is more convenient to pay the fee than to go through the process of contracting with a recycler. In addition, the tight supply of pounds in program year 14 made it more difficult for manufacturers to make last-minute weight purchases after the end of the program year. In total, 37 manufacturers had paid a shortfall fee as of May 2024. The amounts ranged from \$0.40 to \$31,932. The DNR granted shortfall fee waiver requests from 21 manufacturers that demonstrated good faith progress toward meeting their recycling targets in program year 14, totaling more than \$6.5 million in shortfall fees.

Table 5 summarizes registration and shortfall fees paid under E-Cycle Wisconsin.

Ensuring a level playing field within E-Cycle Wisconsin

Much of the DNR’s administration of the electronics recycling law focuses on maintaining a level playing field for E-Cycle Wisconsin participants and identifying problems at collectors or recyclers that might endanger human health or environmental quality.

Manufacturer registration compliance

Manufacturers must comply with Wisconsin’s electronics recycling law by registering their covered

Figure 5: Comparison of weight recycled and manufacturer targets, by program year

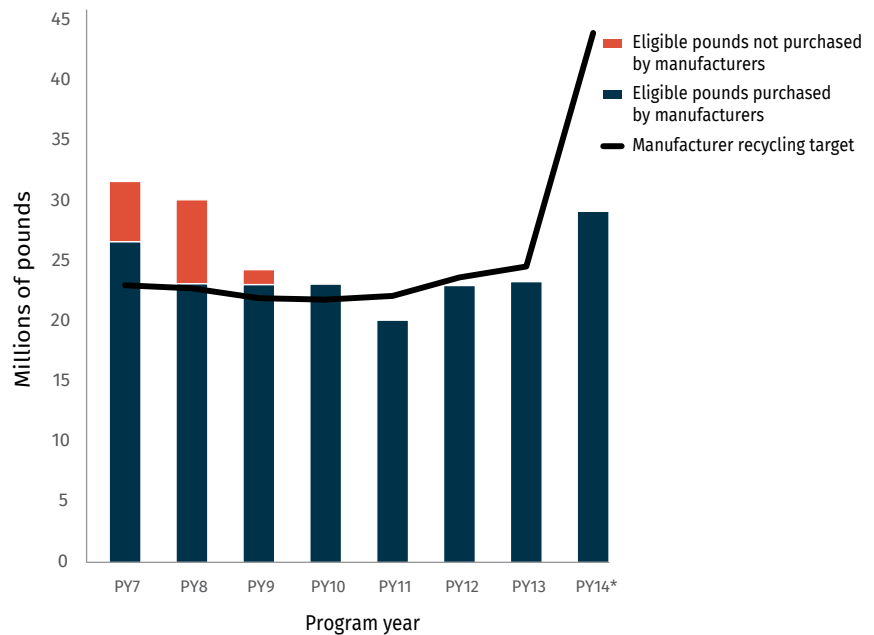


Table 4: Program year 14 manufacturer credit transactions

	Credits
Beginning balance	173,845
Credits applied	(162,848)
Credits expired	(2)
New credits earned	3,334
Total available for future use	14,329

Table 5: Manufacturer registration and shortfall fees

Program year	Registration fees	Shortfall fees
7	\$408,750	\$8,812
8	\$375,000	\$8,124
9	\$370,000	\$14,066
10	\$338,750	\$9,607
11	\$358,750	\$21,203
12	\$361,250	\$68,845
13	\$317,500	\$52,630
14	\$315,000	\$70,320

Shortfall fees for program year 14 as of May 2024.

electronics and paying applicable registration and shortfall fees. During program year 14, the DNR revoked nine manufacturers’ registrations for failure to submit required forms or payments. Five returned to compliance. The remaining four had stopped selling covered electronics. Six other manufactures that received a notice of noncompliance (NON) from the DNR for failure to complete registrations returned to compliance during program year 14.

To ensure a level playing field among electronics manufacturers, the DNR continued its effort to bring manufacturers of unregistered brands into compliance. In addition to retailer compliance efforts described below, the DNR contacts manufacturers to inform them of their obligation to register, and communicates with other state programs about brand status. The DNR maintains lists of registered and unregistered brands on its website to help retailers and manufacturers stay up-to-date with registration status. During program year 14, 20 manufacturers completed their initial E-Cycle Wisconsin registration,

the majority of them following contacts from the DNR or from retailers the DNR had notified. As of May 2024, there were 204 unregistered brands tracked by the DNR, primarily from manufacturers selling a low volume of covered electronics through online retailers.

Electronics retailer compliance

Under Wisconsin’s electronics recycling law, retailers must sell only registered brands to Wisconsin households and schools. They also must inform customers that electronics may not go into the trash and provide information about how to recycle electronics. These requirements apply to brick-and-mortar stores as well as online stores. The DNR reviews electronics retailer inventory online and in stores, and checks stores and websites for compliance with the customer education requirements.

In program year 14, the E-Cycle Wisconsin program conducted two rounds of online brand checks, consisting of 17 unique online retailers, and 15 in-store inspections of brick-and-mortar stores. The DNR notified retailers of the results of these checks, with a reminder about retailer requirements under the law. As mentioned above, several manufacturers registered or re-registered with the program after retailers contacted them based on the DNR’s checks. The DNR also continued to follow up with retailers regarding customer education requirements and suggested changes to ensure full compliance with Wisconsin’s law.

Registered recycler compliance

All electronics recyclers operating in Wisconsin must comply with solid and hazardous waste regulations. Registered E-Cycle Wisconsin recyclers must meet additional requirements, which apply whether the facility is located in-state or out-of-state. These include maintaining owner financial responsibility (OFR) to cover facility closure and at least \$1 million in pollution liability insurance; reporting to the DNR twice a year; and providing information on the weight of electronics recycled, sources of those electronics, and which downstream vendors received the electronics and their components.

The DNR conducts annual inspections of all in-state registered recyclers. The inspector reviews inventory, shipping and downstream vendor records to determine whether electronics are moving through the facility in a timely manner and ending up at a legitimate end market or properly disposed. The in-

spector also reviews the facility’s closure plan and OFR to ensure the amount of money set aside is adequate to properly close the facility.

Out-of-state recyclers are also inspected, but less often because of travel constraints. For these recyclers, the DNR conducts desktop record reviews for closure cost estimates, OFR and pollution liability insurance. In addition, DNR staff check in with recyclers if questions arise regarding downstream vendors, sources of materials received or changes to their recycling process.

Table 6: DNR inspections conducted, by program year

Time period	Recyclers	Collection sites
July 1, 2015, to June 30, 2016	7	37
July 1, 2016, to June 30, 2017	8	73
July 1, 2017, to June 30, 2018	9	60
July 1, 2018, to June 30, 2019	8	64
July 1, 2019, to June 30, 2020	3	24*
July 1, 2020, to June 30, 2021	7	71
July 1, 2021, to June 30, 2022	10	61
July 1, 2022, to Dec. 31, 2023**	9	112

* Includes 13 in-person inspections of collection sites and 11 phone inspections with collectors due to the COVID-19 pandemic.

** 18-month program year

During program year 14, the DNR conducted in-person inspections at all nine in-state recyclers.

Table 6 lists the number of collection site and recycler inspections the DNR has conducted for the last several program years.

Registered collector compliance

The DNR assesses collector compliance through annual reports and inspections. Due to the large number of collection sites (averaging between 350 and 400 permanent sites), E-Cycle Wisconsin staff are unable to inspect all sites on a routine basis, and therefore prioritize inspections on sites where they can have the most impact. This includes inspecting new sites to provide technical assistance during the start-up phase, collectors that receive large amounts of electronics either on their own site or by operating as a consolidation point, and collectors that also dismantle some electronics. In addition, the DNR addresses complaints received about sites through an inspection or phone call. Occasionally, staff inspect non-registered collection sites to provide technical assistance or investigate complaints.

In program year 14, E-Cycle Wisconsin staff conducted 102 in-person inspections at registered collection sites and 10 at non-registered sites, two of which were repeat inspections. Nearly all sites were meeting program requirements and following best management practices. The DNR also suspended two collectors’ registrations for failure to submit annual reports. One collector subsequently submitted the form, and one is no longer registered.

Electronics recycling separate from E-Cycle Wisconsin

Before July 1, 2023, collectors and recyclers that performed basic disassembly of electronics were exempt from most solid and hazardous waste requirements if the materials were handled appropriately. Consequently, many recyclers operated without any DNR regulatory oversight and the DNR would only become aware of sites after a problem occurred. Under the new administrative rules, the DNR will be able to better monitor recycling activities.

During 2023, the DNR did extensive outreach about its new administrative rule, which took effect in

July and created new standards for collecting, storing, transporting and processing electronics. The rule requires facilities recycling more than 25 electronic devices a year to obtain a DNR solid waste processing approval and license. The DNR created two new guidance documents, one outlining requirements for electronics collection sites and one for electronics processing facilities. DNR staff also conducted a webinar and four in-person workshops around the state, and contacted dozens of facilities that may need a processing license by email, mail and phone. The DNR's technical assistance and outreach efforts will continue in 2024.

Illegal disposal and irresponsible electronics processing

DNR staff received few complaints regarding mismanagement of electronics between July 2022 and December 2023. None of the complaints were significant and were mostly addressed by sending a letter to clarify regulations. In a handful of cases where property owners discovered electronics (mainly TVs) abandoned on their property, the DNR connected them with recyclers or authorized brokers to cover recycling costs under E-Cycle Wisconsin. One site received a visit from a DNR warden since there were additional issues that needed to be addressed. One of the cases had additional solid waste violations and a warden conducted a site inspection, which resulted in a notice of noncompliance (NON).

For the last decade, the DNR worked on an enforcement case against 5R Processors, a business headquartered in Ladysmith that was a registered E-Cycle Wisconsin collector and recycler from 2010 to 2014. 5R abandoned millions of pounds of electronics, hazardous leaded cathode ray tube glass, and other hazardous materials at several sites across Wisconsin. Though three former 5R managers received criminal convictions in the case and two were ordered to pay the DNR restitution for cleanup costs, these payments did not cover the full cost of cleaning up the abandoned material so that it would no longer pose a risk to human health and the environment and so the affected properties could be returned to productive use.

In spring 2022, the Legislature passed and Gov. Evers signed a bill (2021 Wisconsin Act 234) providing \$2.5 million in state funding to remove waste at sites formerly operated but no longer owned by 5R Processors. The 2023-2025 biennial budget increased the total amount appropriated for the cleanup to \$4.5 million, in addition to the restitution payments from former 5R managers.

In winter 2023, the DNR contracted with Veolia Environmental Services to remove and properly manage electronics and other related wastes that had been abandoned by 5R Processors. The project consisted of cleaning up the electronics from five locations in Ladysmith, Catawba, and Glen Flora.

The first phase of the project began March 6, 2023, and was completed on May 5, 2023. During this phase, Veolia cleaned out the materials in a warehouse located in Glen Flora and nine semi-trailers in three locations in Ladysmith. Veolia removed 965,301 pounds of cathode ray tube glass and mixed electronics from the warehouse in Glen Flora, in addition to minimal amounts of other waste materials. After all materials were removed, the facility was cleaned using a HEPA vacuum due to concerns about lead-containing dust. The nine semi-trailers in Ladysmith were not road worthy, so the materials were removed, sorted, repackaged and transported on different semi-trailers to appropriate end markets.

The second phase of the project included the removal of materials from the former 5R site in Catawba, which took place from June 12 to Sept. 14, 2023. The highest volume materials included 490,453 pounds of crushed cathode ray tube glass, 261,284 pounds of mixed electronics and 183,334 pounds of plastics. The total cost of these cleanups (as of May 2024) was \$2,157,509, with \$100,000 coming from restitution

payments and the rest from the funds the Legislature appropriated.

Disposal ban compliance and outreach

In addition to the cases of irresponsible recycling discussed above, the DNR continues to receive reports of electronics being dumped on public lands, in ditches and in vacant lots, along with reports of electronics put in the trash. Often, these are cases of an individual dumping one or two items, most commonly TVs, and are difficult to track in a systematic way.

Household electronics disposal choices

In winter 2024 the DNR conducted its seventh statewide household survey on electronics recycling since E-Cycle Wisconsin began. As in previous surveys, the 2024 results helped the DNR measure awareness of Wisconsin’s electronics recycling law and compliance with electronics disposal bans.

The survey asked, “In the last 12 months, what did you do with each of the following electronic items that you no longer wanted?” Among respondents who had a device they no longer wanted, about 70% of households had stored unwanted computers, 59% had stored unwanted cellphones and 49% had stored unwanted TVs during the previous 12 months. The percent of households that had stored unwanted devices increased substantially for all three device types from 2021 to 2024.

Nearly all households that did not store an unwanted device opted to recycle or reuse it. Figure 6 shows all the recycling/reuse options combined. Only a small percentage of households reported putting a cellphone (2%), computer (1%) or TV (3%) in the trash.

Public awareness efforts

The electronics recycling law requires the DNR to promote public participation in electronics recycling and facilitate communication among local governments and electronics collectors, recyclers and manufacturers. The DNR meets this requirement through advertising and social media campaigns, news releases and providing outreach materials for local governments and program participants to distribute. These efforts help ensure households and schools are aware of the disposal ban on electronic devices and that manufacturers meet their recycling targets.

The DNR’s 2024 household survey showed awareness of the electronics disposal ban rose from 48% of respondents in 2021 to 57% in 2024, the highest level since 2013. Awareness of E-Cycle Wisconsin decreased slightly from 31% in 2021 to 28% of respondents in 2024.

Figure 6: What households did with unwanted electronics during previous 12 months, based on 2024 DNR survey

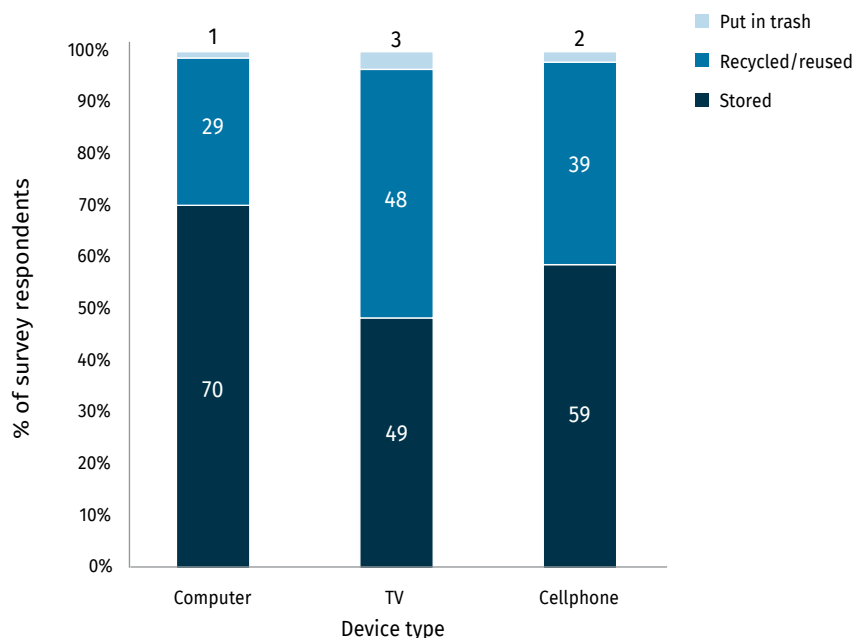
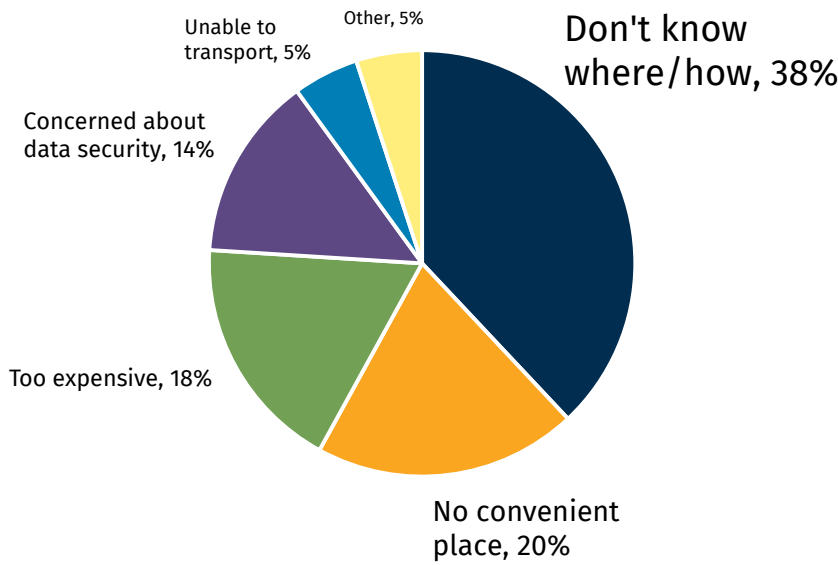


Figure 7: Reason household unable to recycle electronics during last 12 months, based on 2024 DNR survey



Addressing program challenges

The DNR gathers input through surveys and conversations with program participants, other stakeholders and the public when evaluating whether changes are needed to make the electronics recycling law function better.

Wisconsin's law is designed to operate on free-market principles, with collectors, recyclers and manufacturers conducting private negotiations to set recycling prices. In recent years, consumers and collectors have paid

an increasing share of the costs of recycling. Combined with limited access to registered collection sites in some parts of the state, this has led to cases of illegal disposal and dumping, stockpiling by irresponsible recyclers and challenges for manufacturers in meeting their recycling targets.

The DNR has worked with the Legislature, Gov. Evers and program stakeholders to identify and implement policy solutions for these challenges, and the DNR's E-Cycle Wisconsin staff have focused their work on addressing barriers to electronics recycling and providing technical assistance.

Identifying and addressing electronics recycling barriers

The DNR's household recycling surveys have asked respondents about reasons they were unable to recycle electronics despite wanting to do so. As shown in Figure 7, the top reasons on the 2024 survey were "Didn't know where or how" (38%), "I didn't have a convenient place to recycle" (20%), "It was too expensive" (18%) and "I was concerned about my data security" (14%). These percentages were nearly identical to those from the DNR's 2021 survey.

To help address the barriers of lack of awareness, cost and lack of convenient recycling locations, the DNR continues to maintain and promote its online list of registered E-Cycle Wisconsin collection sites and manufacturer mail-back programs, including updating it throughout the year with information about one-day collection events.

The DNR's 2022-23 advertising campaign used digital advertising, paid search ads, paid and unpaid social media, sponsorship messages on Wisconsin Public Radio and ads on Spanish-language radio stations to drive Wisconsin residents to the DNR's list of registered collection sites and mail-back programs. This included targeted posts on NextDoor and Facebook to promote free collection events around the state. Overall, the DNR's electronics and battery recycling webpages received nearly 650,000 visits between July 2022 and December 2023.

To address concerns about data security, collectors can ensure their operations securely handle da-

ta-containing devices, and work with recyclers to provide information to customers on how data are kept secure and destroyed. The DNR’s 2023 electronics recycling rule requires collection sites to protect electronics from theft and vandalism, which can include using locked containers, storing data-containing devices in locked rooms and other site security measures. Collectors and recyclers could also explore options like hosting events with on-site hard drive shredding.

Improving access to responsible electronics recycling in underserved areas

For many years, access to convenient and affordable electronics recycling has been uneven across Wisconsin. A handful of rural counties have had only sporadic collection events, and both urban and rural areas have at times lacked collection opportunities open to all residents, not just those of certain municipalities.

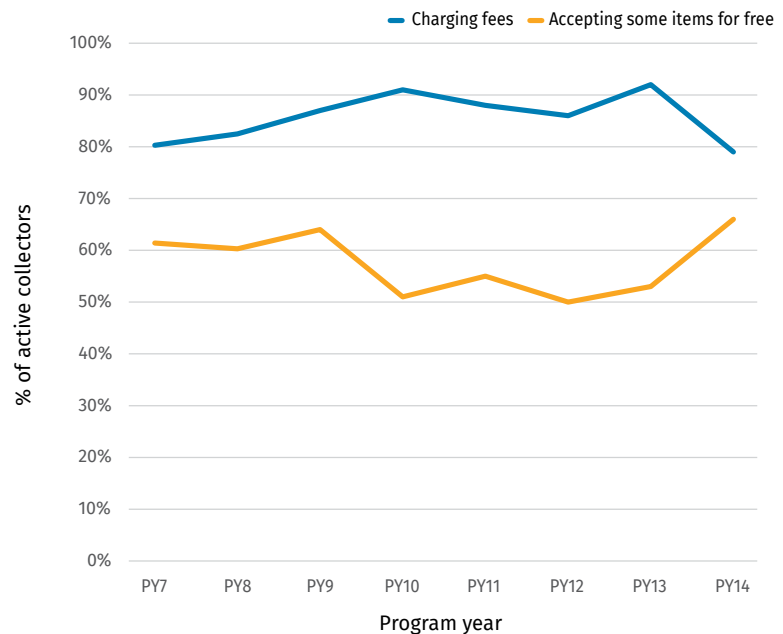
In June 2022 and March 2023, the DNR awarded grants under the new E-Cycle Wisconsin Electronics Collection Grant Program, authorized by 2021 Wisconsin Act 79. The program, funded by manufacturer shortfall fees, aims to improve access to electronics recycling in underserved areas of the state by funding one-day collection events or establishing a permanent collection site in counties that have lacked registered collection sites or events. The DNR awarded more than \$135,000 to 29 projects in 18 counties (see map in Appendix D). These projects supported development of three permanent collection sites in Kewaunee and Pepin counties, and 30 one-day collection events between August 2022 and May 2024. This included projects in five of the six counties (Florence, Forest, Iron, Kewaunee and Marquette and Price) designated by statute as highest priority because they had not had any registered collection sites during the July 2020-June 2021 or July 2021-June 2022 program years. The grants funded multiple free collection events in all of these counties except for Price. The DNR expects to award another round of grants in 2024.

Reducing costs for consumers and collectors

As shown in Figure 8, the percentage of collectors charging consumers fees for electronics had increased for several years, but dropped in program year 14 to 79%, the lowest since program year 6. The percentage of active collectors taking at least some items for free rose from 53% in program year 13 to 66% in program year 14.

These positive changes were primarily due to more financial support from manufacturers, who increased payments to recyclers and directly sponsored free collection sites or events during program year 14. Between July 2022 and December 2023, there were at least 60 free, one-day collection events in 38 counties that were open to all county residents or had no residency restrictions. There were

Figure 8: Percent of registered collectors charging fees and accepting some items for free





The aftermath of a major fire in May 2023 at the Milwaukee materials recovery facility. While the exact cause of this fire is unknown, a lithium-ion battery is suspected. Photo courtesy city of Milwaukee.

even after a consumer has discarded a device and can spark and cause fires if damaged. Lithium-ion batteries from devices thrown in trash or recycling bins, and even those properly brought to electronics drop-off sites, have caused many fires nationally in the last several years. A 2021 U.S. Environmental Protection Agency study documented 245 fires between 2013-2020 that were likely attributed to lithium-ion batteries and concluded that 89% of them were definitively caused by lithium-ion batteries. The number is likely far below the number of fires actually caused by lithium-ion batteries because there is not a requirement to report fires.

Although numbers have not been tracked, the DNR has received several reports of fires likely or definitively caused by lithium-ion batteries in recycling/trash collection trucks and at transfer stations, recycling facilities and landfills in Wisconsin. In 2023, fires heavily damaged recycling facilities in Columbia County, Milwaukee and Whitewater. Recyclers are spending additional money to train workers, revise procedures and invest in fire-suppression systems. The challenge will grow as more electronics containing these batteries enter the waste stream.

The DNR has increased outreach efforts to better inform Wisconsin residents of how to safely manage used batteries and electronics that contain them. In an effort to reduce the risk of fires and encourage proper recycling, the DNR's administrative rules added telephones with a video display, as well as phone accessories and video gaming devices/accessories that contain batteries, to the list of electronics that can be recycled through E-Cycle Wisconsin. The DNR will continue to work with stakeholders to increase public outreach about batteries and identify potential additional policy solutions.

also permanent collection sites accepting all eligible electronics for free from all residents in seven counties (see map in Appendix C). This represented unprecedented access to free recycling, especially of TVs, for many Wisconsin residents.

The DNR's new grant program is also helping to reduce costs for consumers in underserved areas of the state. During program year 14, there were 14 free collection events in nine counties funded by DNR grants.

Ensuring safe management of lithium batteries in consumer electronics

Lithium-ion batteries—used in many portable electronics—can retain a considerable charge

Recommendations for potential legislative changes

Based on the first 14 years of implementation and positive feedback from stakeholders, most of the fundamental elements of Wisconsin's electronics recycling law are sound and have proven effective. Despite recent positive changes, some challenges remain that could best be addressed through additional legislation. These ideas for the Legislature's consideration, submitted under s. 287.17(10), Wis. Stats., are based on extensive conversations with stakeholders over the last several years, in addition to analysis of program data.

Consider updating device definitions to address today's consumer electronics

As technology changes, it has been difficult for the DNR to determine whether devices are covered by the definitions in s. 287.17(1), Wis. Stats. Examples of these "gray area" products include smartphones, digital picture frames, photo printers and portable DVD players. Device definitions and program requirements could be revamped to:

- Update the definition of consumer computer so that it is easier to determine whether new or updated products with video displays smaller than 7 inches are included.
- Broaden the definition of video display device so that it includes items with screen sizes greater than 7 inches, such as portable DVD players, that are very similar to TVs and monitors but not currently included.
- Grant the DNR authority to update the list of covered electronic devices by rule, similar to its existing authority under s. 287.17 (10) (i), Wis. Stats., to update the lists of eligible electronic devices and devices banned from disposal.

Consider actions to reduce fire risk from battery-containing devices in the waste stream

Fires caused by lithium-ion batteries, including those embedded in electronic devices, are causing injuries, deaths and significant property damage, including devastating fires in waste collection and processing operations. To help address and alleviate the risk from battery-containing devices, the Legislature could consider the following actions:

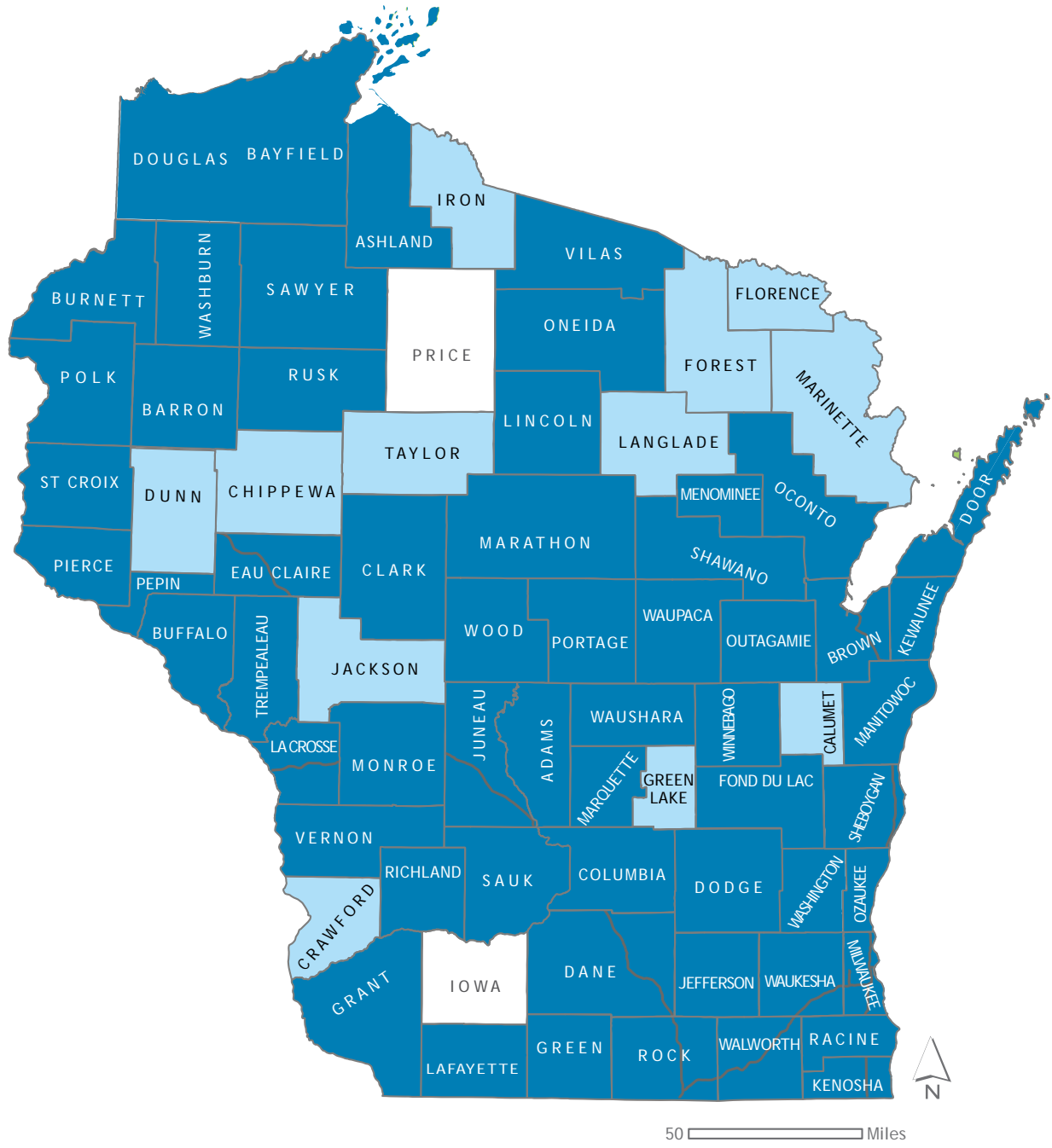
- Expand the list of covered electronic devices under s. 287.17 (1), Wis. Stats. This would require manufacturers of these devices to help fund recycling of their devices. This would work best for consumer electronics that are already collected as eligible electronics under the program, or similar devices that could be handled by the same electronics recycling facilities.
- Provide funding for waste facilities to install or upgrade fire detection and suppression equipment, including systems that monitor 24 hours a day for fires.
- Add more battery-containing devices as eligible for manufacturer recycling obligations under E-Cycle Wisconsin, and/or ban such products from landfill and incinerator disposal under s. 287.07 (5), Wis. Stats. This could help drive public education and perception about not putting battery-containing devices in trash or recycling bins and might increase recycling of battery-containing devices by making them eligible for current manufacturer financial support under E-Cycle Wisconsin. This could also provide more weight to help manufacturers meet their recycling targets.

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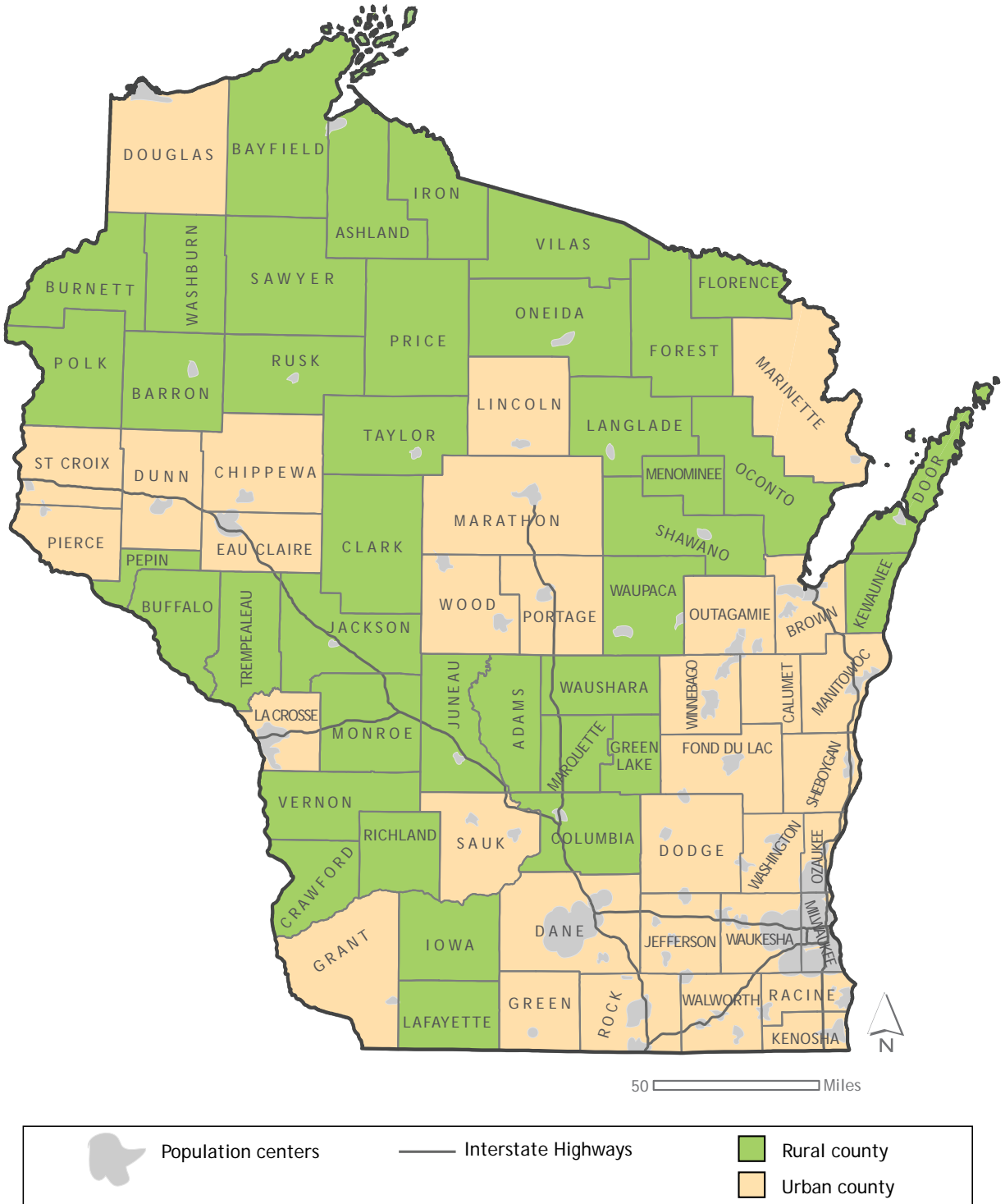
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Appendix A: Counties with collection sites or events accepting all eligible electronics from all residents, July 2022-December 2023 program year

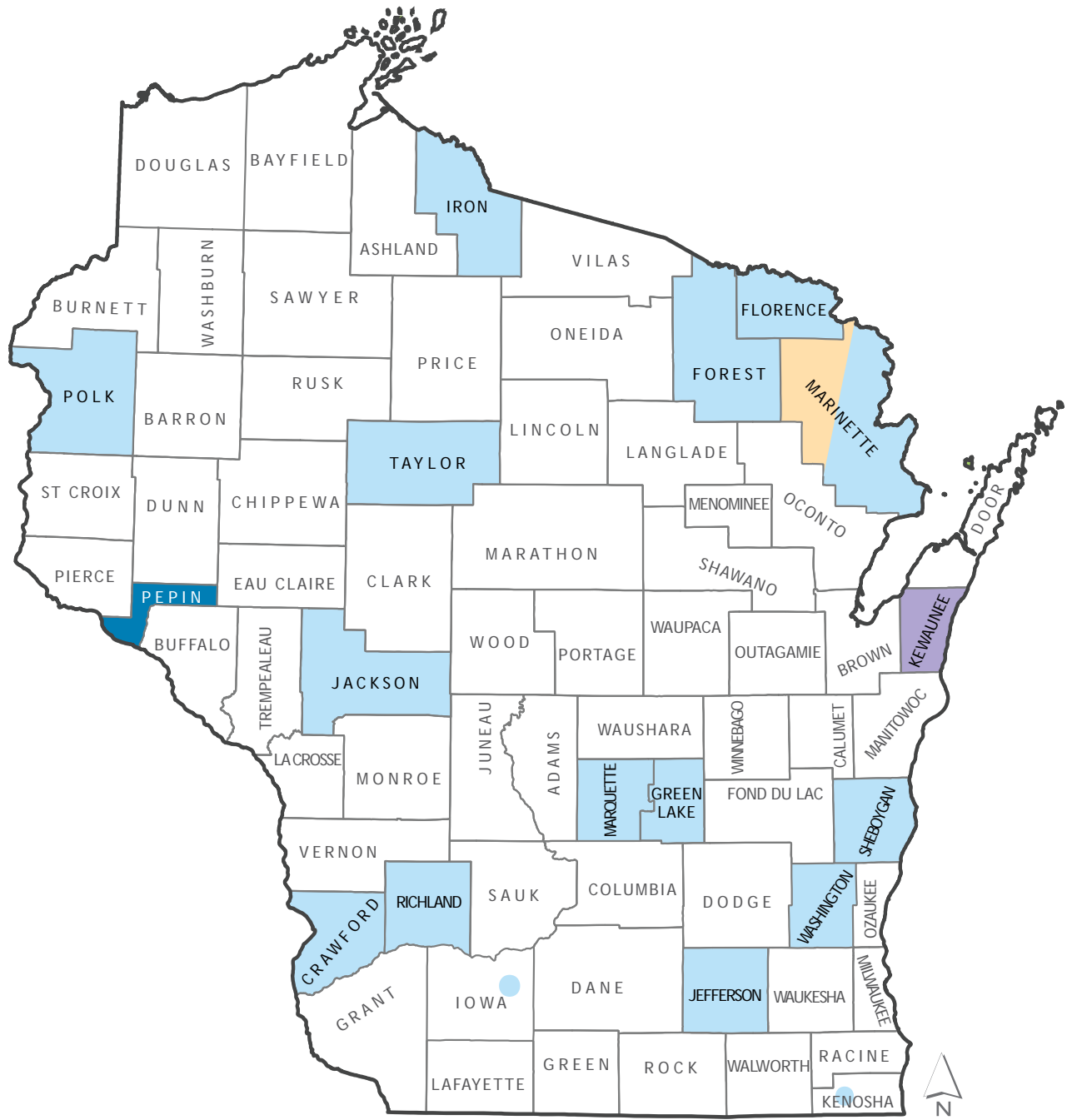


- Collection site open to all residents
- Collection event open to all residents
- No site or event accepting all EEDs

Appendix B: Map of urban and rural counties under E-Cycle Wisconsin

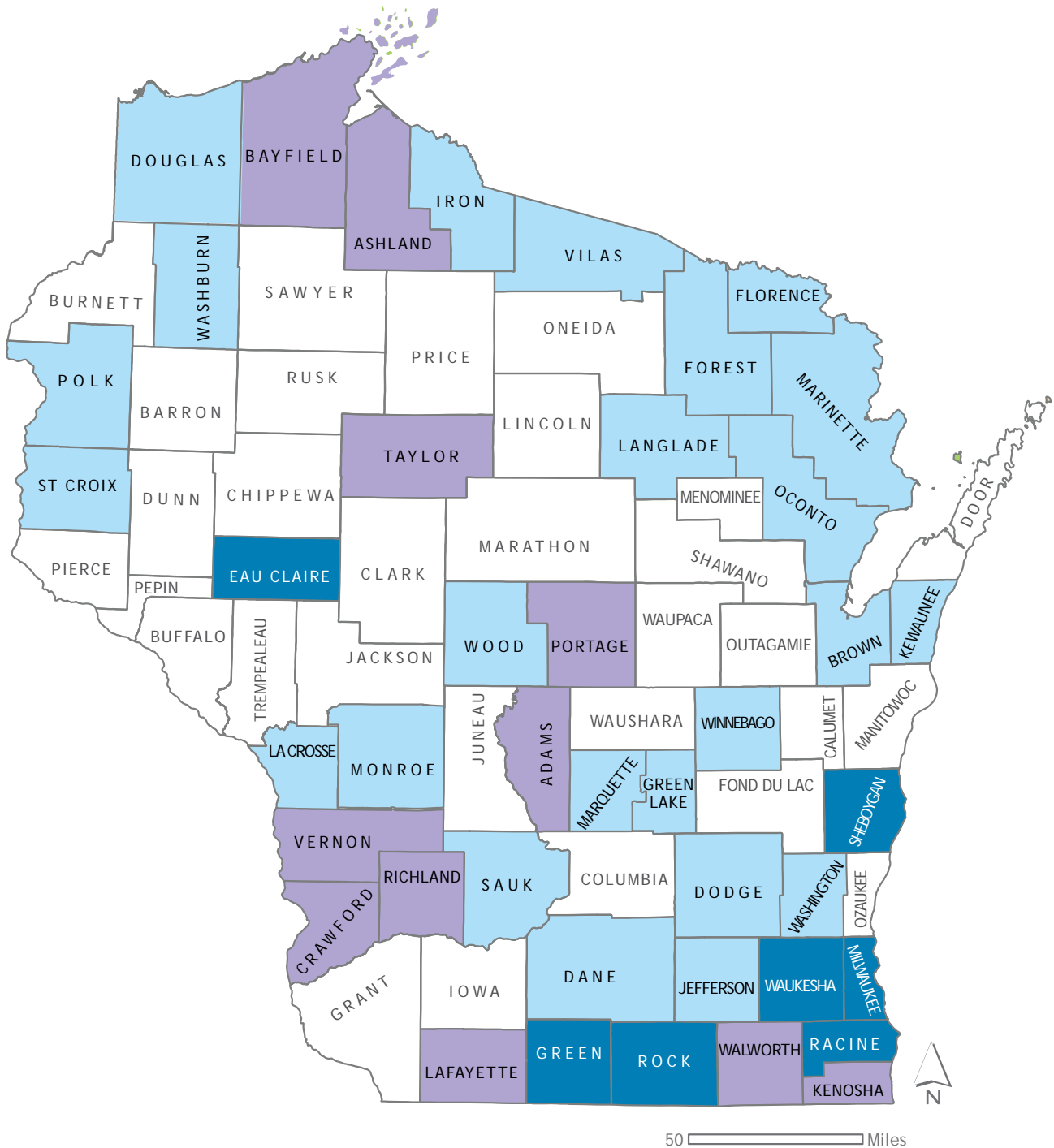


Appendix C: E-Cycle Wisconsin Electronics Collection Site Grant awards, 2022 and 2023



- Received grant for permanent site open to all county residents
- Received grant for collection event open to all county residents
- Received grant for municipal collection event

Appendix D: Counties with free collection sites or events for all eligible electronics, July 2022-December 2023 program year



- Free collection site open to all residents
- Free collection event open to county residents
- Free collection event open to all residents
- No free collection site or event open to all residents