2020 Status Report on Connecticut's State-wide Consumer Electronics Recycling Program

Over 151 Million Pounds of Unwanted Electronics Recycled, 78 Recycling Jobs Created, and Over $6.8 Million Dollars Saved By Municipalities!

Pursuant to Section 22a-639(a)&(b) of the Connecticut General Statutes ("CGS"), the Connecticut Department of Energy and Environmental Protection ("DEEP") presents its status report ("report") on Connecticut's state-wide electronics recycling program ("program").

This report is required to:

- evaluate the effectiveness of the program;
- provide information about any national program which substantially meets or exceeds the requirements of Connecticut's program, if applicable; and
- set forth DEEP's plan and actions to achieve its on-going program implementation goals.

Program Summary:

Connecticut's electronics recycling law (CGS Section 22a-629 thru Section 22a-640) is one of 25 state laws requiring electronics manufacturers to pay for the recycling of their products based on an Extended Producer Responsibility ("EPR") model. Specifically in Connecticut, the electronics manufacturers pay an equitable allocation of cost to fund the collection, transportation and recycling of residentially generated Covered Electronic Devices ("CEDs") which means computers, computer monitors, printers, and televisions sold to consumers. This program has no direct cost to consumers or municipalities. Recyclers are approved by DEEP to ensure responsible recycling practices are being used. Towns are responsible to provide for the convenient and accessible collection of CEDs for their residents. Most towns have chosen to use an existing transfer station or regional waste collection as their collection points, while other towns use special collection events, or designate specific businesses as a drop off location. This report documents the continuing success of the EPR framework for electronics recycling in Connecticut.

Since February 2011, Connecticut's electronics recycling program has transformed the collection and recycling of unwanted CEDs in Connecticut. The result is thousands of tons annually of unwanted electronics getting recycled into new products, creating new jobs, keeping toxic materials out of the environment, and to date over $6.7 million dollars saved in avoided disposal fees by Connecticut's municipalities. The manufacturers that make the products are financing the system that recycles them. Connecticut was the fourth of 25 states to have an electronics recycling program financed by electronics manufacturers.

Connecticut's electronic recycling program and other EPR programs (paint, mattresses, etc.) will continue to play an important role in achieving the state's diversion goal of 60% by 2024 as established by P.A. 14-94 (codified in CGS Section 22a-241(a)) and the Comprehensive Materials Management Strategy adopted in July, 2016). EPR reduces costs for municipalities, ensures materials are recycled instead of disposed, and creates jobs. EPR also incentivizes manufacturers to both reduce the use of toxic materials in products, and to manufacture their products for recyclability so that the products can be more easily and completely recycled.

The State Fiscal Year ("SFY") 2020 data analyzed by DEEP was derived from the semi-annual reports required to be submitted by the four (4) Approved Covered Electronics Recyclers ("CERs"), and supplemental information and data from registered manufacturers of CEDs. Census population data was used to determine the state-wide pound per capita rates for unwanted electronics collected under the program.

Program Successes (by the Numbers):

- In SFY 2020, over 10 million pounds of CEDs were collected by CERs, yielding a state per capita rate of 2.96 lbs/capita (2.87% decrease[1] from SFY 2019).

- In SFY 2020, CERs reported the following electronic waste components were recycled.

  - CRT glass containing lead - 2.9 million lbs. (estimated over 201,000 lbs. of lead recycled) (16.5% decrease from SFY 2019)
  - LCD/LED screen – 160,000 lbs. (0.05% increase from SFY 2019)
  - Scrap metal – 3.0 million lbs. (37.7% increase from SFY 2019)
  - Plastics - 1.3 million lbs. (8.0% increase from SFY 2019)
  - Circuit boards - 437,000 lbs. (29.5% decrease from SFY 2019)
  - Mercury containing materials – 12,600 lbs. (468.6% increase from SFY 2019)
  - Glycol – 3,400 lbs. (39.4% decrease from SFY 2019)
  - Batteries – 18,400 lbs. (69.0% increase from SFY 2019)

- Electronics manufacturers reported 524,160 pounds of CEDs collected for recycling (33% decrease from SFY 2019) under established private programs. Under such private programs, manufacturers generally partner with recyclers or retail stores of their choice to collect and recycle their own products. With the addition of 2 new private program established in SFY 2020 (Epson America, Inc. and Microsoft Corporation) and withdrawal of one, electronics manufacturers have established 16 total private programs available to CT residents. In general, private programs increase convenience by establishing additional collection opportunities for Connecticut residents including retailer drop off points such as Best Buy, Verizon, and Goodwill, or through mail-back programs.

[1] It appears that the weight of CEDs collected may have peaked in SFY 2017. See "decline of CRTs and light-weighting" discussion under Program Challenges / Next Steps Section.

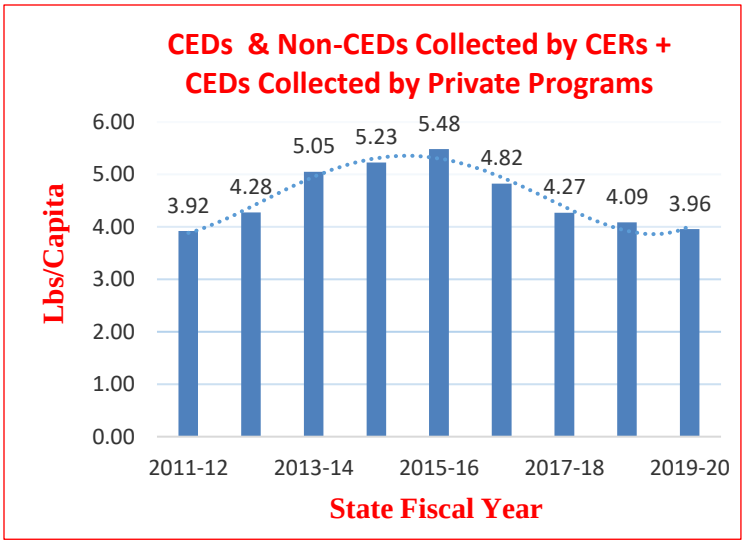
- With 10.5 million pounds of CEDs collected by CERs in SFY 2020, it is estimated that manufacturers paid $3.9 million dollars to CERs collectively based on their national market share or return share data and the average price per pound of $0.378. This price includes recycling, transportation, and storage of CEDs being collected.

Since Program Inception (SFY 2011-2020):

- Over 151 million pounds of unwanted electronics have been collected cumulatively. The breakdown is as follows:

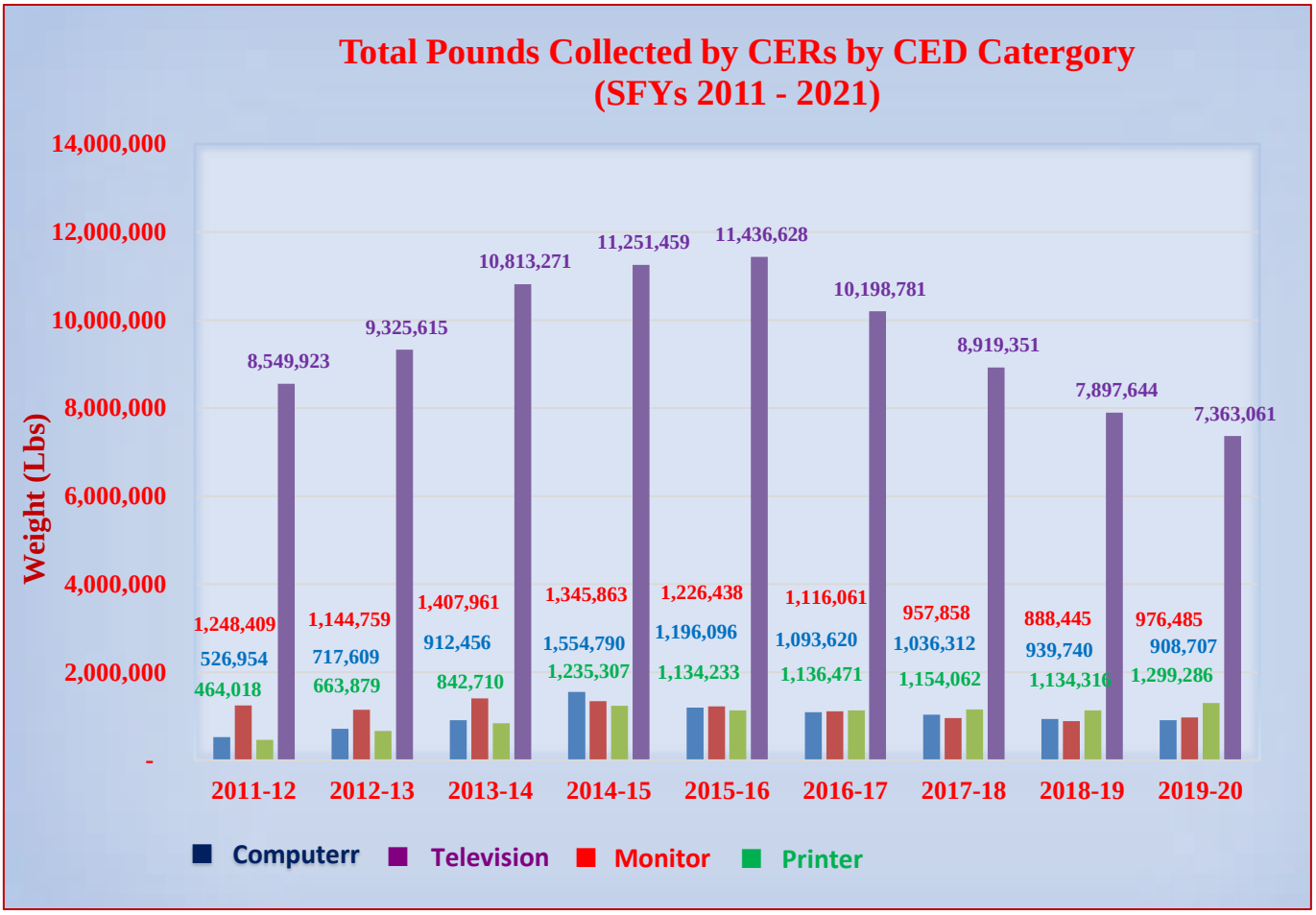
  - 116 million pounds of CEDs collected by CERs;
  - 10.3 million pounds of CEDs collected by electronics manufacturers' private programs; and
  - 24.5 million pounds of other unwanted electronics (Non-CEDs such as computer keyboards, VCRs, DVD players, etc.) collected by CERs.

- The total weight of CEDs reportedly collected by CERs and electronics manufacturers in private programs and all other non-CEDs reported by CERs in SFY 2020 exceeds 14.0 million pounds, which equates to a state per capita rate of 3.96 lbs/capita. See trend depicted in Table 1 to the right. Televisions accounted for the majority of the weight of CEDs with an average of 69.8% of the reported weight collected. Printers were the next highest product category with 12.3% of the reported weight collected. The remaining weight was monitors (9.3%) and computers (8.6%). See Table 2 for total pounds collected cumulatively by CED category.



- Table 2, shown on the next page, depicts a decrease in total weight of CEDs collected by CERs, including the televisions collected. Data from SFY's 2019 and 2020 suggests a 14.4% reduction of older, heavier cathode ray tubes ("CRTs") being collected in the waste stream and newer, lighter technology flat screens recycling through the program. Data from SFY 2020 also suggests that over 2.5 million pounds, of the total televisions being collected are flat screens. This is a 15.5% increase from the previous SFY. Light weighting is also contributing to the decreases in weight of other CEDs collected.

- Since the last report in 2019, 1 additional job has been created in Connecticut. Of the 78 direct jobs, 56 of these jobs are located in Connecticut, and another 21 jobs are located within the northeastern states, improving the local and regional economy with direct and indirect jobs.



- Over $6.8 million dollars have been saved by Connecticut's municipalities in avoided disposal fees by diverting unwanted electronics. In SFY 2020, municipalities collectively saved over $611,000 in avoided disposal costs.

Program Benefits (On-going):

Less waste in the trash since program implementation in 2011. The quantity of "electronics" disposed in the trash dropped by 76%[2] resulting in less waste burned at waste-to-energy facilities, or landfilling when waste-to-energy capacity is lacking.

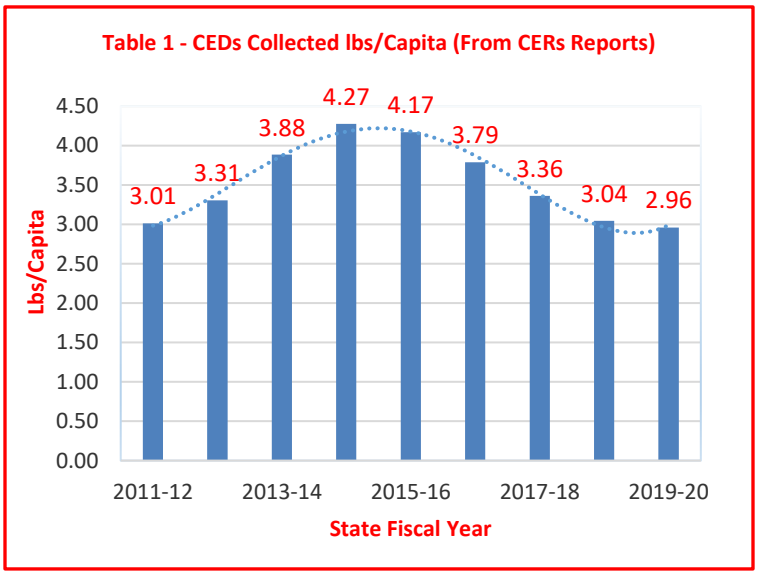
No fees for consumers and no recycling/disposal costs for municipalities. Before the establishment of Connecticut's program, most household electronics were discarded in the trash, or consumers often were charged for recycling with limited availability to recycle even if they wanted to. For residential electronics thrown in the trash, most Connecticut municipalities would be charged for collection and disposal [up to $90 per ton]. Some towns and regions collected waste electronics separately for recycling, but had to pay for those services from their own funds. Now manufacturers pay the cost for 100% of the electronics collected for recycling by towns from residents.

[2] According to data from Connecticut's Waste Characterization Studies conducted in 2010 and 2015.

Convenience and Accessibility. Before Connecticut's program, limited collection locations existed. There are now over 165 approved collection locations statewide that form a convenient and accessible collection network. Currently, there is state-wide collection coverage, including 150 municipal transfer stations, most of which are open year-round, and 15 regional collection locations. Other approved collection locations include some thrift stores like "Savers" and Red, White and Blue and businesses specializing in electronics collection and recycling (Green Monster e-Cycling LTD located in West Hartford and Take 2 Inc. located in Waterbury). Each municipality must have a collection plan approved by DEEP, so residents should check with their local recycling coordinator for locations and drop off times. In addition to approved municipal collection sites, electronics manufacturers have also established private (collection) programs for their CED products.

Program Challenges (Next Steps):

While DEEP considers Connecticut's program to be effective for collecting and recycling unwanted CED and providing Connecticut residents with convenient and accessible collection options, DEEP recognizes that there may be opportunities to improve this program. DEEP plans to seek input from various stakeholders on the challenges outlined below. DEEP plans to work with stakeholders to:



- Identify program efficiencies/improvements while continuing to meet Connecticut's electronics recycling law requirements, including but not limited to, free and convenient collection;

- assess the development of new or additional program measures like consumer awareness, carbon footprint and greenhouse gas emissions avoided as a result of Connecticut's program;

- assess increasing recycling rates by possibly expanding the scope of collection by including schools (K-12), municipal CEDs, colleges and universities, small businesses and non-profits. Such expansion would be consistent with numerous other states' EPR programs; and

- further reduce recycling costs by going to a market share billing approach for computers, monitors and printers like most other state programs have done. A market share approach is already in place for billing televisions in Connecticut.

a. Program Measures / Goals

- Connecticut's program collected a rate of 2.96 pounds per capita in SFY 2020, which equates to a 2.8% decrease in weight from SFY 2019 data. While this rate does not meet DEEP's state-wide goal[3] of 4.0 pounds per capita, this rate is expectedly lower than past years given the trend of product light-weighting and pandemic influence in 2020. DEEP continues to assess the suitability of a per capita measure and is working with stakeholders to decide whether to use it, expand it or replace it in out years. Important factors to consider include the decline of CRTs and device weight discussed in the next paragraph.

- "Decline of CRTs and Device Weight": The sale of consumer electronics containing CRTs (the heaviest part of electronic waste) declined to virtually zero in the early 2010s. Indeed, the weight of CRTs peaked in 2016 and has been declining annually, along with the total weight of CEDs collected. In addition, most electronics are generally being manufactured to be lighter, smaller and more mobile, although TVs are getting lighter and larger. Consequently, future collection rates based on weight are expected to continue to decline. This decline presents an opportunity to reassess how to properly evaluate success of Connecticut's program. DEEP plans to assess more closely the quantity of material that is disposed over time especially wood and plastic. Based on the CERs' reports, 1.78% of the total weight of CEDs is disposed as waste or residue that cannot be recovered from the recycling activities, which is a 28.8% decrease from SFY 2019.

b. Outreach and Education

- Despite collection locations in each town and various retailers according to a 2016 survey, 55% of residents are unaware of Connecticut's program. DEEP will, within available resources, continues look for way to increase consumer awareness and participation.

c. Policy and Coordination

- DEEP continues to evaluate whether certain electronic devices may be considered to meet the law's definition of a CED, including certain hand held devices, game consoles, external data storage devices, satellite or cable boxes, virtual reality handsets and certain printers, including certain 3-D printers that may also print on paper.

- DEEP continues to work with Northeast Recycling Council (NERC) and Electronics Recycling Coordination Clearinghouse (ERCC) to:

  - seek market share data directly from manufacturers to reduce costs and facilitate assigning national market share to each manufacturer covered by Connecticut's program ; and

  - assist manufacturers to register in Connecticut using ERCC's online e-cycle registration system. This system is more cost effective and a solution for electronic registration

[3] In 2007, DEEP set a convenience and accessibility goal of 4.0 lbs./capita on a state-wide basis on an expectation that each town/region meet that goal. This goal may no longer be the best measure of program performance with newer, smaller and lighter products entering the waste stream.

submissions. This year, DEEP allowed the submission of electronic registrations by manufacturers using the NERC/ERCC system. 74 of a total of 83 manufacturers submitted electronic submissions to-date (89% rate).

d. Compliance Assurance

- CRT glass recycling options are declining and becoming more expensive. This is an international problem, and Connecticut is not immune. It is the main reason why some private programs no longer accept CRT devices. Recyclers are under pressure to store more of this glass to reduce their costs. As a result, DEEP has created an electronic, monthly CRT glass report to track the movement of CRT glass. Since June, 2016, CERs report to DEEP the total quantity of CRT glass stored on site at the end of each month. DEEP staff track the trends of CRT glass stored on site, by each CER, and can take necessary actions to address excessive stockpiling. DEEP is also considering the use of a similar tracking tool to monitor other materials of concern, such as mercury.

- Improved accessibility to recycling drop-off points is an on-going need. While every town has an approved collection plan, some towns have reported very little CEDs collected, and DEEP continues to receive calls and emails from some residents expressing concern over the limited options for drop-off/collection of CEDs. DEEP plans to review these situations with the towns to improve the goal of free, convenient and accessible recycling opportunities for all of Connecticut's residents.

- In addition to a comprehensive selection process of approving CERs and their partners, a major program goal has been to verify that materials are going to the approved, responsible recycling destinations. DEEP reviews the accuracy of reported data by CERs including evaluating mass balance accounting of billable weights, and collaborates with other state electronics recycling program contacts to verify out of state references. DEEP may audit the CERs in out years, and may contract again with an independent 3rd party for such audits.

- Manufacturers may audit CERs and seek records from CERs and their downstream partners for CED shipments to verify collection, billing and recycling data. DEEP will work with manufacturers and CERs to facilitate successful audits and findings. With any manufacturer performed audit, DEEP may take independent actions if violations of applicable environmental laws are identified. To-date, one manufacturer has audited at least one of the CERs.

e. Federal/Interstate Program Coordination

While there is no federal electronics recycling program in place at this time, DEEP continues to engage in interstate collaboration to harmonize Connecticut's program with other states to help streamline, reduce costs and improve the recycling infrastructure/ system.

Conclusion

Based on the findings and assessment detailed in this report, DEEP concludes Connecticut's program is working effectively and is well positioned to continue to protect public health and the environment by diverting CEDs into recycling markets, creating green jobs and saving municipalities a substantial cost of disposal for CEDs in accordance with CGS Sections 22a-639(a)&(b).