

SINCE 1968

# Houston Clean City Commission

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## QUARTERLY REPORT Q1 2024; RESIDENTIAL ELECTRONICS WASTE

### OVERVIEW

In accordance with the City's Code of Ordinances Chapter 39 Article III, the Houston Clean City Commission is to direct and oversee a comprehensive litter control program for the purpose of reducing and controlling to an acceptable level the concentration of litter in the city and to bring about a long-term improvement in the attitudes and trash handling habits of citizens. The ordinance in Section 39-37 further directs the Commission to "each quarter, during the months of January, April, July and October submit a written report to the mayor and city council summarizing the status of the clean city program." Through a study completed in 2022, the Commission determined that the regional trash handling habit change which will most greatly impact Houston's ability to effectively compete in a future, more-circular economy is to improve the volume and quality of waste materials flowing directly from waste generators to local facilities engaged in related materials reclamation and to support the development of additional local reclamation capability. With this in mind, each of the Commission's Quarterly reports will focus on how a specific waste type is generated and managed in greater Houston and note opportunities for improvement, if identified. Reports will be kept to two pages, submitted in writing to the City and shared at an upcoming public City Council meeting.

**Our Q1 2024 report focuses on residential e-waste (computers, TVs, monitors, servers, touchpads, power strips, cables, mice, hard drives, printers, servers and similar). For purposes of this report, batteries, e-cigarettes, and small or large appliances such as microwaves, vacuums, dishwashers, refrigerators, etc. are not considered e-waste.**

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### SPECIAL THANKS to these 2024 Q1 report advisors, consultants and industry experts

- Compucycle (Kelly Adels Hess, CEO, and Clive Hess, President)
- City of Houston Solid Waste Management Department (Veronica Lizama, Dep. Director - Administration, David Vasquez, Division Manager - Recycling, Meagan Riche, Administrative Specialist and others)

## Houston Clean City Commission Quarterly Report to City Council

<b>Topic:</b>	Residential E-Waste ( <b>computers, TVs, monitors, servers, touchpads, power strips, cables, mice, hard drives, printers, servers &amp; similar</b> ).		
<b>Date:</b>	05/30/24	<b>Committee:</b>	Comm'rs Tyler, Smith, Machado, Wilfalk, Clark, Boehme, Asaduddin, Gonzalez, Yearwood and Roberts

### Overview:

Although e-waste represents a small fraction of the total waste stream by volume, the inclusion of harmful and/or toxic substances as well as rare and precious metals in the manufacturing of the original products makes e-waste recycling a topic of both concern and opportunity. According to the Global E-waste Statistics Partnership (GESp), metals worth an estimated \$91 billion were embedded in the e-waste discarded in 2022. This valuation is larger than the global market for several specialty metals combined. At the same time, these resources can only be safely recovered under carefully controlled conditions in order to avoid hazardous or toxic exposures or releases to the environment. Because of the high cost of recovering the most valuable materials from e-waste, there is significant economic incentive to divert this waste to informal, under-regulated or unregulated recycling destinations, generally outside of the US, where incomplete materials recovery is accomplished in a manner damaging to human health and the environment.

E-waste recycling is logistically and operationally complex. The process can be conceptualized as beginning at a receiving facility and then passing through some number of other downstream facilities until the original material ends up either as a manufacturing input or discarded. Materials collected are typically first sorted by product type (ex: TV, laptop, cables, mobile phones, printers) and then different product types follow different reclamation pathways. It is not uncommon for e-waste receiving facilities to serve as sorting and transfer sites only or as partial deconstruction, sorting and transfer sites. It is also not unusual for some downstream facilities in e-waste recycling chains to be located outside of the US.

Some e-waste items, such as computers or cell phones, are burdened with potential data security issues. Data security concerns complicate an already labyrinthine materials flow. Commercial entities can be held liable for data breaches even if that data breach occurs after hardware disposal. Therefore, data security concerns lead to facility security and chain of custody requirements for e-waste processing facilities, adding expense accordingly. In practice, specific guidance or lack of guidance with respect to data security liability can lead to a decision to recycle, rather than refurbish, an otherwise recoverable device.

Multiple industry certifications intend to provide assurance of responsible e-waste materials handling, most notably R2-v3 and e-Stewards. Both R2-v3 and e-Stewards require compliance with an internationally recognized environmental, health & safety management system and address data security concerns. In addition to more subtle differences in certification requirements, e-Stewards prohibits export of electronics scrap from OECD to non-OECD countries while R2-v3 permits such transfers provided evidence of the import/export legality is verifiable\*. For this reason, e-Stewards is more restrictive of export.

In 2007, the State of Texas passed a law that requires manufacturers of certain electronic products to provide Texas household consumers with free collection, reuse and recycling opportunities for those devices. While manufacturers are required to offer consumers a recycling opportunity, consumer participation is not mandatory and the Texas law only applies to equipment purchased for personal or home business use.

### Current State (system participants, areas of local success, regional/national models to follow)

Residential e-waste is accepted by the City at Westpark Consumer Recycling Center, the two Environmental Service Centers and monthly at temporary collection events at Kingwood and Clear Lake. Nationally, more e-waste is landfilled than recycled. Although e-waste is a small fraction of solid waste overall, it accounts for up to two thirds of heavy metals found in landfills.

The technical capacity to process all e-waste domestically exists and industry-leading practice has been demonstrated in Houston. Compucycle, at their 8019 Kempwood Dr. facility, processes electronic scrap (Ex. computers, printers, screens, and hard drives) down into steel, aluminum, copper, plastic and circuit boards. The steel is shipped directly to a steel mill for remanufacturing, the copper is shipped directly to a copper smelter, the aluminum shipped directly to an aluminum smelter and the circuit boards are shredded and shipped directly to a smelter for the recovery of non-ferrous and precious metals. Plastics are washed and

separated into polypropylene, polyethylene, polystyrene and ABS and shipped directly to plastics remanufacturing facilities to be pelletized for reuse. E-waste received by Compucycle's Houston processing facility is likely to have the geographically shortest overall e-waste-to-resource path in the nation.

Most of the e-waste recycled is commercial, not residential. By analogy to more easily tracked waste streams, the commercial sector likely recycles e-waste at a considerably higher rate than the residential sector and data security concerns likely make the gap even more pronounced. Residential e-waste is likely the sector with the greatest opportunity for materials management improvement.

## Challenges and Opportunities

1) **Additional promotion of third party options:** Dell Connect, offered through Goodwill, (<https://www.dellreconnect.com>) and [Best Buy's recycling and trade-in program](#) merit promotion through City communication channels because they offer generally free drop-off for many items as well as convenient locations for most residents. Additionally, the Texas Commission on Environmental Quality (TCEQ) publishes the following websites to inform Texas consumers of free collection, reuse and recycling opportunities available for their unwanted TVs, computers and monitors: [www.TexasRecyclesComputers.org](http://www.TexasRecyclesComputers.org) and [www.TexasRecyclesTVs.org](http://www.TexasRecyclesTVs.org). These pages provide an alphabetical list of links to manufacturer's recycling websites, by brand. The TCEQ websites could be promoted directly or, even better, the information in these TCEQ websites could be restructured and presented in a more user-friendly manner prior to promotion. Promoting select third-party e-waste recycling options through City communications channels is recommended and the Commission commends the Solid Waste Management Department for taking steps in this direction.

2) **Additional City-led e-waste collection:** The objectives of the City's e-waste collection efforts should be to affordably supplement third-party options until these options demonstrate the capacity to handle the majority of the waste stream generated and to strategically support, to the degree reasonable, local e-waste processing. E-waste is an attractive waste stream to target with one-off collection events because citizens tend to save e-waste before making a conscious decision to discard it and, due to data security concerns, e-waste drop-off and collection must be monitored. Kingwood statistics demonstrate that one-day collection events can result in over 10,000 lbs collected and that effective event promotion is key to impact. Implementing a monthly pop-up collection event whose location rotates through Districts not served by the Kingwood, Clear Lake or Westpark sites is recommended with each location/event collaboratively selected and co-promoted by the Solid Waste Management Department and City Council. Ideal sites would have an available forklift and ample parking and/or enough open paved space to set up temporary drive through service. The relative collection and disposal costs from all City-led collection efforts should be tracked for purposes of future program optimization.

3) **Explore enhanced citizen service:** A significant fraction of residential e-waste landfilled is TVs left out for bulk waste collection. Many private programs charge a fee to take back TVs and/or monitors, particularly larger TVs or monitors, so recycling (vs. discarding) these items can be not only less convenient for citizens but also more expensive. Although many manufacturers offer consumers a free mail-back option, mail-back program utilization is low and lack of citizen awareness is likely not the only barrier to program participation. Participation rates in these programs could be negatively influenced by a lack of trust, a lack of familiarity (they are often third-party branded), a language barrier or other factors. Exploring whether a 3-1-1 service could be implemented which would position the City to request free shipping labels and/or boxes on behalf of citizens needing to dispose of TVs or monitors is a low-cost and pragmatic way to start to phase out TV and monitor pickup service long-term in the absence of a landfill ban. While neither Texas law nor City ordinance ban TVs, monitors and other e-waste from landfill disposal, such rules have been enacted in many other states.

4) **State-level advocacy:** The bills that created the Texas Computer Equipment Recycling Program and the Texas Television Equipment Recycling Program were passed in 2007. The law is outdated and should be at minimum modified to cover additional items like most other states, including video game system components, printers (including 3D printers), smartphones, video / audio equipment, and computer/TV accessories like speakers and with penalty fees for violations made proportional to manufacturer market share (vs. fixed).

5) **Focal point:** The Commission's 2023 Q4 residential yard waste report recommended designating a SWMD point person to be responsible for monitoring and regularly reporting on yard waste program status/progress. This report expands this recommendation to suggest that a designated point person within SWMD be tasked with monitoring and reporting progress towards all Commission recommendations.