

Circular Electronics Impact Standard

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INTRODUCTION

The Circular Electronics Impact Standard is an environmental, social, governance (ESG) impact measurement framework designed for the electronics reuse and recycling industry.

It requires reporting facilities to disclose key metrics and, optionally, have their ESG disclosures assured, and impact claims independently verified. The framework establishes a unified reporting structure for the electronics reuse and recycling value chain intended to standardize disclosures and impact measurements to create consistency and reliability in claims that are relied upon by others.

The Standard was developed by a multi-stakeholder group – the Technical Advisory Committee (TAC) – through an open, transparent, and consensus-based approach in conformance with the ANSI Essential Requirements under the ANSI Accreditation of SERI. The TAC consists of representatives balanced across the following key stakeholder groups: entities covered by the Standard who will be reporting information, customers or those with a material interest in the entities reporting information, and those in or with a public interest; regulatory or governments – international, national, or regional; and any other individual or organization that has an interest in, is materially affected by, or has special expertise regarding impact reporting.

The Standard development process included seeking, considering, and responding to public comments. The process ensured all interested parties had the ability to participate in the revision process. This version has been approved by the balanced Consensus Body of the TAC according to the SERI Manual of Policies and Procedures¹. The published final version of the Circular Electronics Impact Standard is adopted by the SERI Board of Directors.

As the owner and administrator of the Standard, SERI may provide additional guidance or clarification to ensure the consistent application and implementation of the requirements, in line with its originally intended meaning. In addition, any stakeholder can request a Formal Interpretation by the TAC of the meaning or intent of a specific requirement of the Standard by completing a submission in accordance with the SERI Manual of Policies and Procedures. Any changes to the Standard must be approved by the Consensus Body, including the publication of Formal Interpretations. The Consensus Body-approved Formal Interpretations shall be relied upon to audit the meaning or intent of a specific provision of the Standard. Any statement, written or oral, that is not adopted by the SERI Board of Directors as a Formal Interpretation shall not be considered or binding in auditing to the Standard.

¹ SERI Manual of Policies and Procedures for American National Standards Development is publicly available at <https://sustainableelectronics.org>.

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APPLICABILITY

The Circular Electronics Impact Standard applies to facilities, referred to as “reporters” in the Standard. See the “Terminology and References” section for details.

The intent of the Circular Electronics Impact Standard is for reporters to disclose circular electronics common key metrics through a self-disclosure process for the purpose of reporting consistent and comparable data across the industry.

The standard applies to reporters seeking to self-disclose measurements and voluntarily assure disclosures and verify impact claims. Third-party assurance, verification, and the process for obtaining these items are outside the scope of this standard and will be addressed in a separate document issued as part of the broader CEI Program.

PURPOSE

Throughout different industries there are frameworks that outline recommendations for impact reporting focused on ESG and sustainability impacts. The electronics reuse and recycling sector does not have a framework for measuring sector-specific ESG and sustainability impacts. This Circular Electronics Impact Standard aims to close that gap. While the Standard is not intended to measure the quality of reuse and recycling, environmentally sound management is an important qualifier to becoming a reporter under the Standard. Therefore, meeting an approved industry standard is one of the qualifiers that defines a reporter.

The Circular Electronics Impact Standard focuses on sector-specific, quantitative reporting. The Circular Electronic Impact Standard is sector-specific and identifies material risks within the sector by providing standardized methodologies and metrics the sector can utilize for a harmonized reporting program. Aligned methodologies and metrics will provide consistent, comparable, and measurable impacts in the sector. As material risks in the sector evolve, this Standard will be modified to the changing impact landscape.

It is understood that companies have their own ESG, sustainability, and impact reporting obligations through regulatory and business requirements; therefore, the Standard works to be compatible with other ESG standards while adding unique value for the electronics reuse and recycling sector. The Circular Electronics Impact Standard is designed to complement the following recognized frameworks, including but not limited to GRI Standards, GHG Protocol, ISO 14067 Standard, ISO 37001:2016 Standard, RBA Code of Conduct, and RE100. References to these frameworks are noted throughout the Standard.

The Circular Electronics Impact Standard is a voluntary, stand-alone standard, operating independently of other standards, for reporters to self-disclose measurements, and to voluntarily assure disclosures and verify impact claims. Reporters will have the ability to utilize their disclosures to fulfill customer reporting requirements.

Voluntary Standard; Independent Action. Participation in the Circular Electronics Impact Standard is voluntary, and each reporter decides independently whether to participate and how to conduct its own business. The Standard was developed through an open, balanced, consensus-based process and

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provides a common framework for measuring and disclosing impact metrics. It is not, and shall not be construed as, an agreement, understanding, or recommendation among reporters or any other parties with respect to prices, output, capacity, customers, suppliers, markets, territories, or other terms of competition. Each reporter applies the Standard unilaterally and remains free to compete, to set its own commercial terms, and to determine its own business relationships, including its relationships with DSVs and other vendors. Nothing in this Standard requires or encourages any reporter to refuse to deal with, or to restrict dealings with, any person or entity.

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APPLYING THE STANDARD

When applying the Circular Electronics Impact Standard, note the following:

- The Standard is intended for facilities that conduct any of the following activities, including but not limited to: collect, refurbish, repair, resale, de-manufacturing, asset recovery, or recycling of electronic equipment, components, and materials, referred to throughout the Standard as the **reporter**.
- Words in **bold font** are defined terms and words in *italic* are for emphasis.
- Standards referenced throughout the Circular Electronics Impact Standard are the most recently approved versions of the standards unless there is a specific version indicated by SERI on the sustainableelectronicsrecycling.org website.
- To achieve verified claims, reporters shall reasonably assure disclosures that are outlined in each claim's pre-requisite requirements.
- **Reporters** are prohibited from claiming SERI or third-party assurance or verification without having completed an actual third-party assurance audit or claim verification under the SERI program.
- Reporting of disclosure data shall cover a 12-month period and be submitted within 4 months after the end of that 12-month period, ideally a calendar year.
If disclosures reporting is not based on a calendar year, data shall be broken down by month.

TERMINOLOGY AND REFERENCES

The definitions contained herein are for purposes of determining the meaning of the following terms within this Standard only.

Avoided Emissions: are greenhouse gas reductions that occur outside of an organization's value chain when a product or service enables lower emissions compared with a baseline scenario — such as replacing higher-emission alternatives or through recycling — while fulfilling the same function with lower carbon intensity. Source: GHG Protocol

Community Collection Event: is an organized event open to the public within a set timeframe for collection of used **electronics**, not at the **reporter's** facility.

DSV (Downstream Vendor): any facility, direct or indirect of the reporter, that receives electronics from the reporter for further processing.

Electronics: are any equipment, components, or materials that fall within the scope of industry-specific certifications used as standard prerequisites (R2, e-Stewards, etc.).

Electronic Device Categorization (EDC): this reference document is intended to be used in conjunction with the Standard and provides guidance on categorization of components and materials. Guidance Document (*Normative/Informative*)

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Employee: individual who is in an employment relationship with the organization according to national law or practice. Source: GRI 3: Material Topics

Forced Labor: means all work or service that is exacted from any person under the menace of any penalty and for which the said person has not offered himself or herself voluntarily. Source: ILO Forced Labor definition.

Hazardous Waste: is any **waste** that is considered hazardous by the legislation of the region where it is being handled, transported, or received for final disposal.

Non-Hazardous Waste: is any **waste** that is not considered hazardous by the legislation of the region where it is being handled, transported, or received for final disposal.

Waste: is anything that cannot be circulated back into the economy through reuse and therefore is disposed.²

Reporter: is a facility certified to R2, e-Stewards, or an approved industry standard.³

Temporary Employee: employee with a contract for limited period (i.e., fixed term contract) that ends when the specific time period expires, or when the specific task or event that has an attached time estimate is completed (e.g., the end of a project or a return of replaced employees). Source: GRI 3: Material Topics

Tier 1 DSV: the first DSV to directly receive electronics from the reporter in the reverse supply chain.

² Not to be interpreted to be aligned with any waste regulation but only within the context of this Standard.

³ Due to changes over time, approved industry standards are maintained on the SERI website.

DISCLOSURES

2. GOVERNANCE

- a. Company Code of Conduct (CCOC): **Reporters** disclose information on organizational governance related to common standards for business conduct.

Company Code of Conduct
(i) Does the reporter have a documented Company Code of Conduct?
(ii) Disclose if and how the reporter : ○ Prohibits forced labor ○ Prohibits child labor ○ Establishes working hours ○ Ensures fair wages and benefits ○ Ensures humane treatment and prohibits discrimination and harassment. ○ Supports freedom of association and collective bargaining ○ Engages neighbors and community relations ○ Promotes business integrity ○ Prohibits improper advantage or bribery ○ Discloses information ○ Protects intellectual property ○ Promotes fair business, advertising and competition ○ Implements protection of identity and non-retaliation ○ Ensures privacy
(iii) Does the reporter communicate CCOC as part of new hire induction?
(iv) Does the reporter have a documented policy or procedure addressing internal grievances?
(v) Does the reporter have a process to address employees' concerns regarding the CCOC?

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- b. **Governance of Information: Reporters** disclose policies and procedures that ensure organizational data is gathered, stored, processed, and disposed of in a manner that reduces the risk of data breaches and cyberattacks.

Governance of Information
(i) Does the reporter conduct a security risk assessment of organizational data every 12 months?
(ii) If yes to (i), disclose the standard to which the security risk assessment is performed.
(iii) Does the reporter have a documented employee return of assets procedure?
(iv) Does the reporter have a documented worker training program that includes, at minimum, information security awareness policies and procedures?
(v) If yes to (iv), does training include appropriate duties of each worker depending on their responsibilities and access to the reporter's internal data?
(vi) Does the reporter have a documented continuity and disaster recovery plan that includes an emergency mode operational plan and data backup and recovery plan?

3. **CIRCULAR ECONOMY:** The **electronics** value chain can support the circular economy by prolonging the lifespan of **electronic** assets and components through reuse, recycling valuable materials, and conserving valuable resources. The reuse of **electronics** and the recovery of materials through recycling are both measurable aspects of a circular economy within the **electronics** value chain. **Reporters** disclose the total amounts of the following within the reporting period.

- a. **Starting and Ending Inventory:** Disclose the amount of electronics at the facility at the beginning of the reporting period and at the end of the reporting period for each electronic category.

Inventory	Category	Total Weight	Unit Count	Period
(i) Starting Inventory	By Electronic Category	Kg	Where applicable	Starting Date
(ii) Ending Inventory	By Electronic Category	Kg	Where applicable	Ending Date

- b. **Inbound:** Disclose the amount of electronics received in the reporting period for each electronic category.

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Inbound	Category	Total Weight	Unit Count	Period
(i) Inbound Electronics	By Electronic Category	Kg	Required	Reporting Timeline

- c. **Outbound:** Disclose the amount of electronics, components, and materials shipped or transferred in the reporting period for each electronic category.

Outbound	Category	Total Weight	Unit Count	Period
(i) Direct Reuse – Whole Electronics	By Electronic Category	Kg	Required	Reporting Timeline
(ii) Direct Reuse - Components	By Electronic Category	Kg	Required	Reporting Timeline
(iii) Resale	By Electronic Category	Kg	Required	Reporting Timeline
(iv) Outsourced Refurbishment – Whole Electronics & Components	By Electronic Category	Kg	N/A	Reporting Timeline
(v) Whole Electronics for Materials Recovery	By Electronic Category	Kg	N/A	Reporting Timeline
(vi) Components for Materials Recovery	By Electronic Category	Kg	N/A	Reporting Timeline
(vii) Material Separated	By Commodity	Kg	N/A	Reporting Timeline
(viii) Packaging Materials for Recycling	By Commodity	Kg	N/A	Reporting Timeline

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Requirements:

- The normal reporting timeline is based on a calendar year. **Reporters** can report more frequently if tracking on a different fiscal year. However, disclosures shall be traceable to the month/year if not reported for the calendar year.
- Disclosures shall be reported according to the **electronic** categories provided in **EDC**.
- Report both unit count and weight for each **electronic** category, except where “N/A” is indicated in the unit count column.
- If average weight is reported, **reporters** shall disclose methodology used for average weight, including if **EDC** is utilized.

Outbound Descriptions:

- *Direct Reuse – Whole **Electronics***: Fully functional **electronics** tested and data sanitized (if data) and loaded with operating systems through in-house activities and sold or donated for reuse.
- *Direct Reuse – Components*: Fully functional components that are tested, data sanitized (if data) and/or repaired through in-house activities and sold or donated for reuse.
- *Resale*: Fully functional **electronics** that are tested and data sanitized (if data) through in-house activities and sold or donated without the operating system to make each ready for direct reuse.
- *Outsourced Refurbishment – Whole Electronics and Components*: Untested or non-functioning **electronics** and/or components sent for test and/or repair by a **tier 1 DSV** (refurbisher).
- *Whole **Electronics** for Materials Recovery*: Unprocessed **electronics** sent to a **tier 1 DSV** for material separation activities.
- *Components for Materials Recovery*: Components separated from **electronics** for materials recovery by a **DSV**. (Examples: circuit boards, batteries, memory, processors, power supplies, etc.)
- *Material Separated*: Materials separated from **electronics** by activities such as processing, dismantling, and shredding. (Examples: steel, aluminum, copper, plastic, funnel glass, panel glass, etc.)
- *Packaging Materials*: Materials that protect or contain products or materials during transport.

4. RECOVERED RAW MATERIAL

Disclose recovered raw materials from electronics processing. Only include materials in the reported weight that are prepared and ready for direct use in manufacturing by the final processor.

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Processor at Final Disposition	Direct to Final Processor	Indirect to Final Processor	Recovered Raw Materials	Period
a. By Processor Type	Kg	Kg	Kg	Reporting Timeline
Requirements: - Recovered Raw Material may be the product of direct shipments from the reporter to the tier 1 DSV that is a final processor (e.g. smelter) or indirect through one intermediary (e.g. aggregator or broker) to the final processor. - Report only what is supported by records of actual raw material recovered (examples include nickel, cobalt, lithium, manganese, copper, gold, silver, aluminum, polyethylene, polypropylene, acrylonitrile butadiene styrene, high impact polystyrene, etc.) - Final settlement statements or processor yield confirmations; not estimates are required. - The normal reporting timeline is based on a calendar year. Reporters can report more frequently if tracking on a different fiscal year. However, disclosures shall be traceable to each month/year if not reported for the calendar year. - Disclosures shall be reported according to the categories provided in the EDC. - Final disposition is the last processing facility in the recycling chain (e.g. smelter, furnace, mill, etc.).				

5. WASTE MANAGEMENT

Materials that could not be reused in the *Circular Economy* disclosures are reported as wastes. **Reporters** disclose the total **hazardous waste** and **non-hazardous waste** from **electronics**, and the **hazardous** and **non-hazardous** operational waste according to the waste management processing method.

Waste Management	Electronics Waste	Operational Waste	Hazardous Waste	Period
a. Wastewater Treatment	Cubic meters	Cubic meter	Yes/No	Reporting Timeline
b. Incineration (with energy recovery)	Kg	Kg	Yes/No	Reporting Timeline
c. Incineration (without	Kg	Kg	Yes/No	Reporting Timeline

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Waste Management	Electronics Waste	Operational Waste	Hazardous Waste	Period
energy recovery)				
d. Landfilling	Kg	Kg	Yes/No	Reporting Timeline
e. Other Disposal	Kg	Kg	Yes/No	Reporting Timeline
<u>Requirements:</u> ○ The normal reporting timeline is based on a calendar year. Reporters can report more frequently if tracking on a different fiscal year. However, disclosures shall be traceable to each month/year if not reported for the calendar year. ○ Reporters shall report on waste sent to tier 1 DSV waste management facilities only. <u>Descriptions:</u> ○ Electronics Waste: Waste produced from electronics reuse and recycling activities. (<i>Example: shredder filters, wastewater, BFR plastics, “other,” etc.</i>) ○ Operational Waste: All waste other than electronics waste or waste created through processing electronics. (<i>Examples: packaging waste, cardboard, wood, pallets, plastics and polystyrene foam.</i>) ○ It is recommended that disclosures be reported according to the categories provided in EDC.				

6. **DOWNSTREAM VENDORS: DSVs** handling **electronics** globally vary in their adherence to social protection, human rights protections and labor conditions based on their facility’s practices and location.

- a. **DSV Disclosures:** Disclose the following information about **DSVs** that received electronics reported in Circular Economy 2(c) and Waste Generated 4.

DSV Disclosures
(i) Total number of DSVs throughout the electronics reuse and recycling chain.
(ii) Total number of DSVs throughout the electronics reuse and recycling chain located in a different country from reporter.
(iii) For DSVs located in a country with a vulnerability score of 30+ on the Global Slavery Index, total number of DSVs by country.

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DSV Disclosures
(iv) For DSVs located in countries where less than 50% of the population is covered by at least one form of social protection, as measured by the International Labour Organization (ILO), report the total number of DSVs by country.
(v) For DSVs located in a country with an International Corruption Perceptions index of 50 or below, total number of DSV by country.
(vi) Total volume by electronic category and destination of electronics leaving the reporter's country by the reporter or DSV .
Requirements: ○ Forced labor vulnerability score shall be determined from the Global Slavery Index and be reported annually. https://www.walkfree.org/global-slavery-index/map/#mode=data ○ Populations covered by at least one social protection shall be calculated through the World Social Protection Data Dashboard (International Labour Organization). https://www.social-protection.org/gimi/WSPDB.action?id=19 ○ Bribery and corruption score shall be evaluated by the Transparency International Corruptions Perceptions Index and be reported annually. https://www.transparency.org/en/cpi/2024 ○ Total volume is evaluated by weight and unit.

b. Tier 1 DSV Disclosures: Disclose the following information about **tier 1 DSVs**.

Tier 1 DSV Disclosures
(i) Total number of tier 1 DSVs .
(ii) Total number of tier 1 DSVs that are certified to an internationally recognized standard for electronics reuse or recycling.
(iii) Total number of tier 1 DSVs that are certified to a national standard for electronics recycling.
(iv) Total number of tier 1 DSVs that hold environmental, health and safety certifications in any country.
(v) Types of internationally recognized certifications held by tier 1 DSVs .
(vi) How the reporter addresses anti-bribery and corruption for tier 1 DSVs with business requirements, policies, etc.
(vii) Total number of tier 1 DSVs located in a non-OECD country.

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Tier 1 DSV Disclosures
(viii) Total number of tier 1 DSVs located in a non-OECD country that received at least 10% of the reporter's total volume.
(iv) Total number of tier 1 DSVs located in a non-OECD country that received at least 10% of the reporter's total volume and have no type of environmental, health and safety certifications are considered " <u>high-risk</u> " for purposes of the following reporting.
Requirements: ○ Internationally recognized standards for the environmentally sound management of electronics reuse or recycling include R2, e-Stewards, or an approved industry standard. ○ National standards for electronics recycling include ANZ 5377, etc. ○ Certification shall be accredited by a Global ACI member. ○ Total volume is evaluated by weight with measurement used and unit ○ Non-OECD status is identified as any countries not listed as a member of OECD. https://www.oecd.org/en/about/members-partners.html ○ Bribery and corruption score shall be evaluated by the Transparency International Corruptions Perceptions Index and be reported annually. https://www.transparency.org/en/cpi/2024

- c. **Oversight of high-risk tier 1 DSV⁴:** When high-risk tier 1 DSVs are identified in the disclosures, **reporters** also disclose the following information about the oversight implemented to mitigate the risks.

Oversight of high-risk tier 1 DSV
(i) Has the reporter conducted an onsite audit every 3 years for each high-risk tier 1 DSV ?
(ii) Has the reporter conducted annual desktop audits in each of the intervening two years for any high-risk tier 1 DSV ?
(iii) Has the reporter conducted an onsite audit of the high-risk tier 1 DSV within 3 months of the first 2 shipments made?

⁴ Purpose and Limitation. The disclosures and oversight activities in this Section exist solely to promote transparency and responsible due diligence regarding the downstream management of electronics. The risk indicators, country scores, and "high-risk" designations used in this Section are descriptive measures derived from independent third-party indices. They do not, and are not intended to, require, recommend, or encourage any reporter to decline, terminate, limit, or avoid business with any DSV, or with any category, country, or class of DSVs. Each reporter independently determines its own downstream vendor relationships. Nothing in this Standard constitutes an agreement, recommendation, or understanding among reporters or any other parties to refuse to deal with, or to restrict dealings with, any vendor or supplier.

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Oversight of high-risk tier 1 DSV
(iv) Are corrective action plans implemented for any violations identified through regulatory or audit findings of high-risk tier 1 DSV ?

7. LABOR AND EMPLOYMENT PRACTICES: Ethical and responsible labor and employment practices are essential for creating a positive, safe work culture and promoting employee well-being.

- a. **Temporary Employees:** Disclose information about **temporary employees** who worked at the **reporter's** facility.

Temporary Employees
(i) Total number of temporary employees working during the reporting period.
(ii) Total number of days worked for temporary employees .
(iii) Total number of temporary employees hired for full-time employment during the reporting period.
(iv) How information on workers' legal rights is disclosed to temporary employees in a language they can understand.
<u>Requirements:</u> None

- b. **Working Conditions:** Disclose information about employee health and wellness management in the **reporter's** facility.

Working Conditions
(i) How the reporter manages working hours.
(ii) How the reporter manages rest periods.
(iii) How the reporter prevents retaliation against employees taking a leave of absence due to health concerns.
<u>Requirements:</u> None

- c. **Parental Leave:** Disclose information about parental leave for **employees** in the **reporter's** facility.

Parental Leave
(i) Does the reporter provide job security for maternity leave?

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Parental Leave
(ii) Do the reporter's employees have access to paid maternity leave for a minimum of 14 weeks?
(iii) Does the reporter provide unpaid maternity leave for a minimum of 14 weeks?
(iv) Does the reporter have a Parental Leave Policy?
<u>Requirements:</u> None

- d. **Pay Equity:** Disclose information about pay equity for **employees** in the **reporter's** facility.

Pay Equity
(i) Is there a formal review identifying pay equity gaps and what is the frequency?
(ii) Does the reporter disclose pay transparency in recruitment material?
(iii) Does the reporter provide access upon employee request to average pay broken down by gender for comparable roles?
<u>Requirements:</u> None

8. **ACCESS TO USED ELECTRONICS COLLECTION EVENTS AND DONATIONS OF ASSETS:** Providing used **electronics** pickup and/or collection to reduce used **electronics** volumes in communities and offering free or low-cost working devices to under-served communities to reduce digital divides.

- a. **Community Collection Events or Services:** Disclose social good impacts made by the **reporter** in local communities.

Community Collection Events or Services
(i) Total number of community collection events held at public/community locations.
(ii) Total number of days during the year that the facility is open to the public for drop-off of used electronics .
(iii) Total number of public collection services by geographical location.
(iv) Total volume by weight and/or unit count of used electronics received through public used electronics pickup, drop-off or collection bins.

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Community Collection Events or Services
(v) Types of used electronics received through public used electronics pickup, drop-off or collection bins.
<u>Requirements:</u> - Geographical location shall include town/city, state/province, and country. - Ongoing used electronics drop-offs are not considered a community collection event.

- b. **Donations:** Disclose social good impacts made by the **reporter** in donations to bridge digital divides.

Donations
(i) Total number of functional used electronics donated to a charitable organization.
(ii) List of charitable organizations that received donated used functional electronics .
(iii) Total number of functional used electronics sold at a discounted rate to a charitable organization.
(iv) Disclose the geographical locations of the final receiving organization of all donated and/or discounted used electronics .
(v) Is there a documented process for identifying populations served by charitable organizations to reduce the digital divide?
<u>Requirements:</u> Geographical location shall include town/city, state/province, and country.

9. **INCLUSIVE WORKFORCE DEVELOPMENT:** Creating an inclusive workforce requires intentional opportunities and fostering a culture of belonging for individuals across all dimensions of diversity.

- a. **Inclusive Workforce Development:** Disclose information about recruiting, policies, contracts, and culture that fosters a more inclusive workforce for social good.

Inclusive Workforce Development
(i) Does the reporter have recruitment materials and job descriptions that are easy to understand through job posting that provide emphasis on diversifying the workforce?
(ii) Does the reporter have a process to make accommodations that may be required to have an inclusive workforce?

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Inclusive Workforce Development
(iii) Does the reporter have a contract or agreement with a community organization(s) focused on employing and recruiting individuals from different socio-economic and disadvantaged backgrounds?
(iv) Does the reporter have a policy for accommodating a diverse workforce?
(v) Does the reporter conduct annual inclusivity training for all employees?
(vi) Is there a documented process of reviewing and shifting processes, office layout, and culture to be more inclusive?
<u>Requirements:</u> None

10. GHG EMISSIONS: Standardized and consistent tracking of greenhouse gas (GHG) emissions across the electronics recycling chain allows for transparency in carbon-intensity impacts and helps to identify areas for improvement to reduce associated harm.

- a. **GHG Scope 1 Emissions:** Emissions sources outlined below are common to the industry and minimum sources to be considered and reported as applicable to the facility. **Reporters** may provide other common data sources.

Emissions Source	Data Input	Common Data Source
Heating	Heating source (natural gas, propane)	Direct meter readings, utility bills, exports from utility online accounts, fuel purchase invoices
	Total fuel type and quantity	
Cooling	HVAC/Refrigeration Unit	
	Refrigerant charge (full system capacity)	Equipment name plate, Manufacturer's spec sheet or manual
	Refrigerant used (e.g. R-22, R-404A, etc.)	
	Annual refrigerant loss (how much refrigerant was added during servicing over the year)	Maintenance records of top ups/refrigerant purchases "Unknown" if not sure
Generators	Fuel type and quantity	Fuel purchase invoices
	If type and quantity not available, generator run time and fuel consumption rate	Generator's spec sheet, manufacturer's website
	Fuel type and quantity	Fuel purchase invoices

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Emissions Source	Data Input	Common Data Source
Other Stationary Fuel Combustion	Description of use (equipment, industrial processes, etc.)	Company processes
Direct Gas Emissions	Name of the gas, mass, units, and description	Gas purchase invoices
Company owned or controlled vehicles (cars, trucks, buses, aircraft, etc.)	Vehicle type	Vehicle
	Fuel type	Vehicle
	Total fuel consumption	Fuel logs
	<i>If total fuel consumption not known, vehicle miles travelled, and vehicle type/year if known.</i>	Mileage logs, odometer readings

- b. **GHG Scope 2 Emissions:** Emissions sources outlined below are common to the industry and minimum sources to be considered and reported. **Reporters** may provide other common data sources.

Emissions Source	Data Input	Common Data Source
Electricity	Purchased Electricity	
	Quantity	Direct meter readings, utility bills, exports from utility online accounts
	% Renewable	Utility service where the reporter has opted for at least 98% renewable service. Disclose if accounting for grid supply renewable service.
	Generated Electricity from Renewable Sources	
	Total generated, total used, total returned to grid	Direct Meter readings, utility bills, third-party installer/owner
	Renewable Energy Credit/"Green attribute" ownership status	Solar contract, third-party installer/owner
	District Cooling	
Cooling	Utility data	Utility bills, internal meter readings, landlord-provided consumption, or software-aggregated records
Heating	District Heating	
	Utility data	Utility bills, internal meter readings, landlord-provided consumption, or software-aggregated records

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- c. **GHG Scope 3 Emissions:** Emissions sources outlined below are common to the industry supply chain outside the facility and are minimum sources to be considered and reported as applicable to the facility. There are additional GHG Protocol Scope 3 categories, but they have been deemed not widely relevant to the industry.⁵ **Reporters** may provide other common data sources.

GHG Scope 3 Category	Questions to Assess Relevance	Examples	Key Data
GHG Category 1 Purchased goods & services	Does the reporter buy materials/products/services for operations?	Goods: Packaging (by material type: plastics, cardboard, wood, etc.), protective equipment, chemicals, tools for operation, rental equipment, professional goods IT related. Services: IT services, consultancies and audits, legal and insurance services, cleaning, marketing, external training, security, subcontractors for outsourced reuse, outsourced processing, maintenance services, hired or leased services, other.	Spend data by category, quantity of goods purchased (kg, units), supplier information
GHG Category 2 Capital goods	Does the reporter invest in buildings, equipment, or infrastructure? Define company capital for calculation. <i>*Exclude leased or second-hand equipment.</i>	New building construction, purchase of machinery (i.e., shredders, crushers, etc.), purchased vehicles (trucks, vans, cars), furniture, shelf racks, new office IT equipment, solar panels, appliances.	Spend or quantity of capital assets purchased (by type), project descriptions

⁵ Category 11 is relevant to electronics sustainability but is excluded because it is not considered material, given the industry's lack of control to influence it — influence rests on the OEM side.

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GHG Scope 3 Category	Questions to Assess Relevance	Examples	Key Data
GHG Category 3 Fuel- and energy-related activities (not in Scope 1 or 2)	Does the reporter purchase electricity, fuel, or heat?	Upstream emissions including production, transportation, transmission, and distribution of a fuel. From usage of fuel, well-to-tank. Upstream emissions from usage of electricity, preparation of electricity. Upstream emissions from transmission and distribution losses from electricity consumption.	Quantity of energy purchased (kWh, gallons, therms), fuel types, emission factors. <i>* Reporter shall utilize same source used in Scope 1&2 reporting.</i>
GHG Category 4 Upstream transportation & distribution	Are raw materials or goods shipped to the reporter by third parties? <i>*If reporting upstream and downstream combined, report here and skip GHG Category 9.</i>	Distance of all third-party logistics (road freight), where emissions are only based on distance and vehicle type. - OR - Weight/distance – emissions based on distance and weight transported (sea, air and rail freight) accounting for weight arranged for transport. - OR - Collection of data from ERP on supplier location and/or processing destination.	Distance traveled, weight or volume of goods, transport mode, fuel type, carrier data
GHG Category 5 Waste generated in operations	Does the reporter generate operational waste handled off-site?	Emissions from recycling of materials and waste-to-energy, as well as materials treated by incineration without energy recovery and landfill, hazardous and non-hazardous. - AND - Materials recovery material included (i.e. precious metals or critical materials). <i>*Could be reported in GHG Category 5 or GHG Category 10</i>	Weight reported within <i>Waste Stewardship Disclosure</i> .

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GHG Scope 3 Category	Questions to Assess Relevance	Examples	Key Data
GHG Category 6 Business travel	Do employees travel for work by air, car, train, etc.?	Emissions reporting from travel agent base. - OR - Rental car, air-rail and hotel breakdown.	Mode of travel, distance traveled or spend by trip type, hotel nights.
GHG Category 7 Employee commuting	Do employees commute to facilities or offices?	Surveys collecting distances and transportation modes. - OR - Averages, location, headcount. - OR - Global and regional commuting averages and common modes of travel.	Number of employees, average commute distance and mode, days per year.
GHG Category 9 Downstream transportation & distribution	Do the reporter ship or distribute products to customers?	Distance of all third-party logistics (road freight), where emissions are only based on distance and vehicle type. - OR - Weight/distance – emissions based on distance and weight transported (sea, air and rail freight) accounting for weight arranged for transport. - OR - Collection of data from ERP on processing destination.	Shipping distance, weight/volume of goods, transport mode, whether the reporter pays or controls shipping.
GHG Category 10 Processing of sold products	Are the reporters' products used in others' production processes?	Material sold as product, material categorized as a commodity that could be used in new production process. - AND - Materials recovery material included (i.e. precious metals or critical materials). *Could be reported in GHG Scope 3 Category 5 or GHG Scope 3 Category 10.	Quantity of product sold, use case, estimated energy/process emissions during customer use.

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GHG Scope 3 Category	Questions to Assess Relevance	Examples	Key Data
GHG Category 15 Investments	Does the reporter hold equity, debt, or project financing	Scope 1 & 2 data provided by the company with equity share to allocate emissions. - OR - Energy consumption data provided by the company with emission factors applied with equity share to allocate emissions. - OR - If Scope 1 & 2 or energy consumption not available and company has similar type of process, then emissions profile can be utilized and scaled to processing capacity.	Emissions from investees (absolute or share of ownership), investment type, financial amount.

VERIFIED CLAIMS

1. CIRCULAR ECONOMY CLAIMS

- a. **Mass Balance:** The settlement between inbound and outbound materials demonstrates a mass balance with less than 5% variance during the reporting period.

Method
(i) Each <i>Circular Economy</i> Disclosure shall be reasonably assured: ○ Starting Inventory (<i>S</i>) ○ Ending Inventory (<i>EI</i>) ○ Inbound Electronics (<i>I</i>) ○ Outbound (<i>OB</i>) • Direct Reuse – Electronics • Direct Reuse – Components • Resale • Outsourced Refurbishment – Electronics and Components • Whole Electronics for Materials Recovery • Components for Materials Recovery • Materials Separated (ii) The <i>Waste Management</i> Disclosure shall be reasonably assured: ○ Waste Generated Outbound (<i>WO</i>) is all electronic waste reported in the <i>Waste Management Disclosure</i>. (iii) If all <i>Circular Economy</i> Disclosures are reasonably assured, then <i>Waste Generation</i> Disclosures for electronic processing waste shall be assured: ○ Waste to Energy ○ Wastewater Treatment ○ Incineration without energy recovery ○ Landfilling ○ Other Disposal (iv) If both <i>Circular Economy</i> and <i>Waste Generation</i> Disclosures are reasonably assured, then calculate the variance. $\text{Variance \%} = \frac{\text{Input} - \text{Output}}{\text{Input}} = \frac{(S + I) - (EI + OB + WO)}{(S + I)} \times 100$ (v) Only <i>OB</i> and <i>WO</i> materials that are included in <i>S</i> and <i>I</i> shall be included. If the variance is 5.0% or less, the reporter can claim a <i>mass balance</i>.⁶

⁶ Mass balance reporting as defined in this standard is intended for inventory transparency and process clarity at the reporter level. It is not intended to support certified output claims or ESG disclosures related to responsible sourcing or recycled content.

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- b. **Reused Electronics:** The percentage of whole electronics that can be verified reused from the total amount of inbound material.

Method
(i) A <i>Mass Balance</i> claim shall be verified before a <i>Reused Electronics</i> claim can be made. (ii) Disclosures shall be reported and reasonably assured by unit count⁷ for the following inputs into the <i>Reused Electronics</i> calculation: ○ <i>Starting Inventory (S)</i> ○ <i>Inbound Electronics (I)</i> ○ <i>Direct Reuse – Electronics (DRE)</i> (iii) <i>Inbound Electronics</i> designated for reuse shall be tracked by a unique identifier through each process step to the <i>Outbound Electronics</i>. (iv) Only Direct Reuse – Electronics shall be used to calculate the percentage of <i>Reused Electronics</i>. (v) Calculate the percentage of electronics sent for direct reuse from total material received using the following formula: $\% \text{Reused Electronics} = \frac{DRE}{S + I} \times 100$

- c. **Recycled Electronics:** The percentage of **electronics**⁸ that can be verified recycled from the total amount of inbound material.

Method
(i) A <i>Mass Balance</i> claim shall be verified before a <i>Recycled Electronics</i> claim can be made. (ii) Disclosures shall be reported and reasonably assured by weight⁹ for the following inputs into the <i>Recycled Electronics</i> calculation. ○ <i>Starting Inventory (S)</i> ○ <i>Inbound Electronics (I)</i> ○ <i>Components for Material Recovery (CMR)</i> ○ <i>Material Separated (MS)</i>

⁷ All inputs are quantified by unit count.

⁸ Electronics are defined as any equipment, components, or materials that fall within the scope of industry-specific certifications used as standard prerequisites (R2, e-Stewards, etc.).

⁹ All inputs are quantified by weight.

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Method
(iii) Calculate the percentage of electronics dismantled, shredded, or otherwise processed ¹⁰ by the reporter for materials recovery using the following formula:
$\% \text{Recycled Electronics} = \frac{CMR + MS}{S + I} \times 100$

2. CLIMATE IMPACT CLAIMS

Climate Impact Claims utilize and rely upon globally accepted standards for consistent calculations of GHG emissions. To standardize emissions calculations, this standard normalizes the minimum common inputs needed to calculate comparable emissions.

- a. **GHG Scope 1 Emissions:** In the context of electronics reuse or recycling, *GHG Scope 1 emissions* is the verified direct greenhouse gas emissions from sources owned or controlled by the **reporter**.

Method
(i) Reporters shall consider and disclose all material <i>GHG Scope 1 emission</i> sources identified in 9(a) of the disclosures section.
(ii) Reporters shall disclose any additional material <i>GHG Scope 1 emission</i> sources not identified in 9(a) of the disclosures section.
(iii) The <i>GHG Scope 1 emissions</i> disclosure shall be reasonably assured.
(iv) Reporters shall calculate <i>GHG Scope 1 emissions</i> according to the <i>GHG Protocol Corporate Standard</i> .

- b. **GHG Scope 2 Emissions:** In the context of electronics reuse or recycling, *GHG Scope 2 emissions* is the verified indirect greenhouse gas emissions from the **reporter's** purchase or acquisition of electricity, steam, heat, or cooling.

Method
(i) Reporters shall consider and disclose all material <i>GHG Scope 2 emission</i> sources identified in 9(b) of the disclosures section.
(ii) Reporters shall disclose any additional material <i>GHG Scope 2 emission</i> sources not identified in 9(b) of the disclosures section.

¹⁰ *Whole Electronics for Materials Recovery* are not considered processed by the reporter and therefore not included in the calculation of *Recycled Electronics*.

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Method
(iii) The <i>GHG Scope 2 emissions</i> disclosure shall be reasonably assured. (iv) Reporters shall calculate <i>GHG Scope 2 Emissions</i> according to the <i>GHG Protocol Corporate Standard</i>.

- c. **GHG Scope 3 Emissions:** In the context of **electronics** reuse or recycling, *GHG Scope 3 Emissions* is the verified indirect greenhouse gas emissions from the **reporter's** value chain that are not directly controlled or owned by the **reporter**.

Method
(i) Reporters shall consider and disclose all <i>GHG Scope 3</i> category emission sources identified in 9(c) of the disclosures section. (ii) Reporters shall disclose any additional material <i>GHG Scope 3 category</i> emission sources not identified in 9(c) of the disclosures section. (iii) The <i>GHG Scope 3</i> disclosure shall be <i>reasonably assured</i>. (iv) Reporters shall calculate <i>GHG Scope 3 emissions</i> according to the <i>GHG Protocol Corporate Standard</i>.

- d. **Anticipated Avoided Emissions from Reuse:** The verified amount of embodied carbon that could be avoided from reusing an electronic in place of manufacturing a new device.

Method
<u>Pre-requisite Requirements</u> (i) A <i>Mass Balance</i> claim shall be verified prior to or simultaneously with the <i>Avoided Emissions from Reuse</i> claim. (ii) Climate Impact Claims for <i>GHG Scope 1 emissions</i>, <i>GHG Scope 2 emissions</i> shall be verified prior to or simultaneously with this claim. (iii) At a minimum, Climate Impact Claims for <i>GHG Scope 3 emissions</i>, categories 1, 4 or 9 shall be verified if logistics are outsourced and/or subcontractors utilized and shall be verified prior to or simultaneously with this claim. (iv) Claims verified within the <i>Avoided Emissions from Reuse</i> shall be based on the same reporting period as the Climate Impact Claims for <i>GHG emissions</i>. (v) Claims shall not overlap or duplicate any other <i>Avoided Emissions from Reuse</i> claims verified for the same customer that the reporter may provide data to. <u>Component & Product Emission Requirements</u> (vi) The reporter shall disclose the make and model of each electronic included in the <i>Avoided Emissions from Reuse</i> claim.

Method

(vii) Product emission data is collected from LCA or Product Carbon Footprint (PCF) studies which have been conducted in alignment with ISO 14040, 14044, 14067 and/or GHG Protocol Product Life Cycle Accounting and Reporting Standard. Product emissions data may be collected from various sources listed below. Best practices are ranked in order of preference.

1. Emissions data from published manufacturers' studies databases, or
2. Independent peer-reviewed emissions sources, e.g. academic papers or
3. The reporter calculates PCF or LCA by electronic category according to EDC.

Calculation

(viii) Ensure that the PCF data and LCA data applied in the calculation has been externally assured.

(ix) Calculate *avoided emissions* from reuse categorized by component or product type using the following formula:

$$AE = E_{mfg} - E_{reuse}$$

(x) E_{mfg} is the cradle-to-gate emissions from manufacturing a new product from extraction to manufacturing.

1. E_{mfg} shall be calculated by the sum of all product emission data calculated and disclosed in 2(c)(i) *Direct Reuse – Electronics* and 2(c)(ii) *Direct Reuse – Components*.
2. Product emission data **within cradle-to-gate boundaries** shall be sourced from (vii).

(xi) E_{reuse} is the sum of verified Scope 1, 2 and 3 emissions from processing for reuse (refurb, repair, etc.), including transport from point of use to processing for reuse. GHG *Scope 3 emissions*, categories 1, 4 and 9 should be included if these activities are outsourced.

(xii) System boundaries: The calculation compares the cradle-to-gate emissions of manufacturing a new equivalent device or component with the emissions from processing the existing device or component for reuse and all associated transportation.

(xiii) Reporting shall be calculated in metrics tonnes or 1000 kg per CO₂e.

(xiv) E_{reuse} emissions and avoided emissions shall be calculated based on the share of equipment prepared for reuse and limited to products or components under the reporter's operational control, to avoid any double counting.

- e. **Anticipated Avoided Emissions from Recycling:** The verified amount of embodied carbon from mining natural resources that is avoided when reusing recovered raw materials ready for direct use in manufacturing by the final processor.

Method
<u>Pre-requisite Requirements</u> (i) A <i>Mass Balance</i> claim shall be verified prior to or simultaneously with the <i>Avoided Emissions from Recycling</i> claim. (ii) Climate Impact Claims for <i>GHG Scope 1 emissions</i>, <i>GHG Scope 2 emissions</i> shall be verified prior to or simultaneously with this claim. (iii) At a minimum, Climate Impact Claims for <i>GHG Scope 3 emissions</i>, categories 1, 4 or 9 shall be verified if logistics are outsourced and/or subcontractors utilized and shall be verified prior to or simultaneously with this claim. <u>Product Emission Requirements</u> (iv) Product emission data is data collected from LCA or Product Carbon Footprint (PCF) studies which have been conducted in alignment with ISO 14040, 14044, 14067 and/or GHG Protocol Product Life Cycle Accounting and Reporting Standard. Product emissions data may be collected from various sources listed below. Best practices are ranked in order of preference. 1. Emissions data from published manufacturers' studies databases, or 2. Independent peer-reviewed emissions sources, e.g. academic papers, or 3. The reporter calculates PCF or LCA by electronic category according to EDC. <u>Calculation</u> (v) Ensure that the PCF data and LCA data applied in the calculation has been externally assured. (vi) Calculate <i>avoided emissions</i> from recycling categorized by materials type using the following formula: $AE = E \text{ (linear)} - E \text{ (circular)}$ $E_{\text{linear}} = (E_{\text{extract}} \times x) - (E_{\text{circular}})$ (vii) E_{extract} is emissions from extracting and preparing raw materials per unit of material (E_{extract}) and is multiplied by the amount of material recovered through recycling (x). (viii) E_{circular} is verified on site- and activity-specific <i>GHG Scope 1</i>, <i>Scope 2</i> and <i>Scope 3 emissions</i> from recycling of electronics of recovered raw materials and processing for recycling throughout the downstream recycling chain which shall

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Method

- be based on site- and activity-specific (everything downstream of the report), emissions shall be from verified *GHG Scope 1, Scope 2 and Scope 3 emissions*.
- (ix) System boundaries: The calculation compares the cradle-to-gate emissions of producing virgin materials with the emissions from recovering equivalent secondary materials through recycling and all associated transportation.
- (x) Reporting shall be calculated in metrics tonnes or 1000 kg CO₂e.
- (xi) E_{circular} emissions and avoided emissions shall be calculated based on the share of equipment recycled and limited to materials under the reporter's operational control, to avoid any double counting.