



Definition of an Ideal Used Electronics Management Program

Used Electronics Management Innovation Workgroup
Electronics Sector, The Sustainability Consortium



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MRM Recycling

PC Rebuilders & Recyclers

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Sprint

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Note: The final ideal program definition presented here is the work of the research team in consultation with the individual Delphi panel participants. This document does not represent or constitute an official statement by any of the participating organizations.

Introduction

Because of the wide variety of organizations responsible for developing programmatic solutions to address the challenges of managing used electronics, a wide variety of program measurement and assessment methods are currently employed. In some cases, original electronics manufacturers (OEMs) have developed and are managing their own programs, and in other cases, service providers, government agencies, and consortia have done so. In order for different used electronics programs to improve, learn from one another, and communicate the effectiveness their program to stakeholders, it's desirable to create a shared definition of what the "ideal" used electronics management program is. By creating a definition of the ideal program, we create a framework for assessment, measurement, data sharing, and tool development.

The goal of this document is to present an Ideal Used Electronics Management Program Definition that facilitates organizations designing or implementing such programs.

The Definition is meant to be pluralistic, providing guidance for all different types of organizations or consortia that might manage a program.

We begin with the premise that an ideal program must itself be sustainable by addressing economic, social, and environmental concerns. A program must strive to protect its workers, the communities and the environment impacted by its operations, prioritize efficient resource use including reuse and refurbishment of equipment, and maintain an economically viable model to ensure that the benefits of the program continue in the future. This is an ambitious goal that may not be attainable today, but one that needs to be defined to drive progress toward ideal performance in this space. Failure to establish sustainable programs will lead to increased costs and environmental and social impacts, legislative pressure, and a continued shortage of infrastructure and capability to transform to a circular economy.

The Definition presented here was developed through the Delphi methodology, which employed an expert panel comprised of multiple stakeholder groups to provide input on what should be included in an ideal program definition and feedback on the Definitions as it was developed. A brief description of methodology and the scope and boundaries that were used to create the Definition can be found in Annex A. A full description of this work and next steps in this project can be found in the companion, "Ideal Used Electronics Management Program Definition - Final Project Report

Used Electronics Management Program Definition

The following definition of a used electronics management program emerged from the Delphi process:

At a minimum, a used electronics management program enables users of electronics to turn over unwanted items for reuse, repair, refurbishment, or material recovery. Either by itself or with external partners, the program collects, handles, and treats the received products and their component materials through reuse and refurbishment to the final recovery of marketable materials and final disposal¹ of non-marketable fractions².

Ideal Used Electronics Management Program Definition

In contrast, the definition of an ideal used electronics management program is:

An ideal used electronics management program enables users of electronics to turn over unwanted items for reuse, repair, refurbishment, or material recovery. Either by itself or with external partners, an ideal program:

- Responsibly optimizes collection, prioritizes reuse and refurbishment of whole products and components,
- Recovers materials and resources embedded in products, components and materials it handles that cannot be reused,
- Ensures all materials reach a responsible final disposal, and
- Minimizes the negative impact of its operations on the environment, workers, and the communities in which it operates.

In order to organize the framework for assessing the dimensions of an ideal used electronics program presented in the above definition, five primary characteristics of an ideal program have been identified as:

- *Program Performance;*
- *Transparency & Accountability;*
- *Consumer Support & Service;*
- *Considerations for Human Health, Safety, & Rights;*
- *Environmental Stewardship.*

The primary characteristics of an ideal used electronics program and their associated attributes are further defined in the following sections.

¹ Final disposal – the point at which no further processing or recovery of materials can be made and remaining material is either incinerated or landfilled. Incineration may include those facilities with waste-to-energy capabilities.

² Non-marketable fraction - post-materials recovery, the fraction of materials from unwanted products received or created by used electronics management programs or their external partners that no longer have a net positive market value as a commodity or feedstock and are disposed of through landfilling or incineration.

Program Performance

Program Performance addresses the overall operation of an ideal used electronics program. Of the three attributes under this characteristic, *Program Tracking & Evaluation* is the foundational attribute required of all programs.

Program Tracking & Evaluation:

An Ideal Used Electronics Program must have clear methods for tracking, evaluating, and communicating program performance relative to goals over time. An ideal program should:

1. Meet all applicable international, national, regional and local treaties, laws and regulations in the locations of operations for both the program and all downstream partners;
2. Publicly set and communicate time-bound performance goals encompassing all attributes outlined for an ideal used electronics management program;
3. Establish a system for evaluating performance against these goals;
4. Track progress against the goals over time, with an annual report available to the public summarizing progress made during the previous year on all program goals;
5. Track and communicate timely updates on corrective actions taken and improvement plans implemented in response to audit findings, where appropriate.

Programs lacking any aspect of this attribute cannot be considered ideal.

Economic Sustainability:

An ideal used electronics management program should achieve cost effectiveness and economic stability while maintaining the necessary level of funding to ensure the environmental and social integrity required of an ideal program.

Collection Rate³

An ideal used electronics management program should understand and be able to communicate publicly the collection amounts, collection methods, fates of all collected products and their components and materials, and changes in collections over time and with respect to the types of products available on the market as new technologies are released.

³ Collection Rate:

An ideal used electronics program has full visibility on the type, collection methods and fate of the products and product component material they are responsible for.

Method: the mechanism or program feature used to collect the product. (e.g., consumer recycling programs, trade-in programs, asset recovery programs from business customers, lease returns, collection events, charity donations)

Fate: the ultimate endpoint for products and their component materials (e.g., reuse/refurbish, material recovery, and parts recovered/refurbished, landfill)

Which types, methods, and fates are relevant will vary by organization, and are therefore not specified as part of the definition. When relevant, programs run by manufacturers should also report the ratio of product received to product placed on the market to provide a better comparison between the actual performances of different programs, especially as new products and technologies change the type of product on the market versus the products being returned through the program (e.g., LCDs on the market versus CRTs returned).

Specific metrics and scope for these different aspects will be determined during the development of metrics to assess used electronics management program effectiveness.

Transparency & Accountability

Under Transparency & Accountability, ideal used electronics programs demonstrate that they track and document the flow and fates of the materials for which they are responsible and that they practice due diligence to ensure that their downstream supply chain operates at the same or better levels of environmental and social responsibility as their own organization. It is important to note that the transparency and accountability of an organization's operations are not limited to the attributes listed here, only that these are a set of attributes directly related to activities that illustrate transparent and accountable operations.

Export Policy

An ideal used electronics management program may include transboundary movement of equipment and materials, but must have mechanisms in place to ensure export is done responsibly and in a manner that is fully consistent with the Basel Convention⁴, including notification and the full consent of all countries involved in the downstream supply chain. When products and component materials are exported, it is critical that they:

- 1) Have positive financial value within the economy that imports them
- 2) Are handled exclusively in facilities with the capability to meet international standards for the protection of human health and environmental health.

All organizations handling used electronic products share accountability for ensuring environmentally and socially responsible treatment and due diligence activities. An ideal program enables both upstream and downstream partners to meet their responsibilities as well.

Auditing & Reporting

An ideal program should perform due diligence on both its own operations and those of its downstream partners to ensure that the products and all components and materials from those products are handled in an environmentally and socially responsible manner which results in new uses or final disposal of material handled. Due diligence includes both auditing downstream operations by the program and reporting from downstream partners to ensure that all contractual requirements are met that signify responsible product, component, and material handling. Additionally, the program must communicate publicly how due diligence activities are implemented for both their operations and their downstream partners.

Certifications & Standards

An ideal used electronics management program must be able to provide verifiable evidence that their downstream partners have an up to date certification to a stringent electronics recycling standard from a third-party certification body, which is accredited to certify to that standard by an International Accreditation Forum (IAF) member. Other processors that are used by an organization or their downstream partners who handle material not considered under the electronics recycling standard must be similarly certified to an appropriate and relevant standard for their appropriate industry when available. Relevant recycling standards may include but are not limited to national, international, regional, or local accredited standards that are available and appropriate for the management program.

⁴ Basel Convention (1989). Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Basel, 22March1989. Retrieved from: <http://legal.un.org/avl/ha/bcctmhwd/bcctmhwd.html>.

Consumer Support & Service

An ideal used electronics program optimizes its Consumer Support & Service in order to ensure that users of the program can effectively access and participate.

Convenience – Cost

An ideal used electronics program offers its services at no cost to users for basic collection and recycling services. Nominal fees tied to the cost of responsible collection, handling, and treatment may be charged by non-profit organizations or for additional services, such as data destruction, offered by any organization at the point of collection. Any fees associated with the program should be communicated clearly and up front.

Convenience – Accessibility

An ideal used electronics management program should ensure that its operations, or those of other organizations contracted by the program to collect products, are easily accessible by its target users, in terms of both location and hours of operation. The program needs to proactively inform the target users about where and how to use the program.

Convenience – Scope of Program

An ideal used electronics management program accepts a full range of electronic products within the IT and consumer electronics space, whether or not required by local, national, or regional regulations and whether or not strictly part of an organization's product portfolio for those organizations dealing in product sales.

Data Protection & Privacy

An ideal used electronics management program must ensure that any customer information or data is rendered inaccessible in order to fully and completely protect the customer's privacy and data. The ideal program is able to provide confirmation that such actions have been undertaken and document that any cost to the consumer is commensurate with the service provided. Methods and proof of destruction may vary with the type of program (e.g., commercial, lease return, individual consumer returns, municipal collection points) to reflect the nature of the administering program.

Consumer Communication

To be effective by any measure, an ideal used electronics management program must communicate its services by targeting the appropriate message to the relevant audience through multiple channels to inform and educate potential users about the program, its availability, the benefits of turning over used products, and the importance and value of reuse and recycling. Additionally, an ideal program must be able to provide evidence as to how it provides consumers with information as well as the scope and effectiveness of their communication. The methods of communication may vary by organization, but must still enable product users to make best use of the program.

Human Health, Safety & Rights

The Human Health, Safety & Rights aspect of an ideal used electronics management program identifies and controls risks related to the health and well-being of workers and the communities surrounding program-related facilities.

Operational Health and Safety Management System

An ideal used electronics management program ensures that its facilities and all downstream partners utilize or adopt all of the practices, methods, and processes necessary to mitigate any negative impacts on worker health and safety. These may include, but are not limited to: reducing or eliminating ergonomic and equipment hazards, monitoring workplace environmental conditions on an ongoing basis, minimizing potential exposure to hazardous materials, maximizing injury and illness prevention including ongoing worker health monitoring for exposure in the workplace, and providing adequate training to workers to ensure the health and safety systems in place are effective.

Upholding Worker Rights

An ideal used electronics management program maintains policies and procedures to protect the legal rights of all workers within its own or downstream partner facilities as well as the rights of these workers that are recognized internationally, nationally, and regionally. An ideal program also ensures that workers are made aware of such rights and not retaliated against for exercising such rights.

Sustainable Communities

An ideal used electronics management program upholds its social responsibility to the communities in which it operates. This obligation includes ensuring that the organization's practices enhance the health and wellbeing of the community as a whole and enabling the community's right-to-know regarding materials handled and released into the surrounding air, land or water by the facility.

Environmental Stewardship

The Environmental Stewardship of an ideal used electronics program aims to conserve the embedded resources in the products and materials handled.

Sustainable Resource Use

To enable efficient resource use and recovery, an ideal used electronics management program should implement and adhere to the waste hierarchy⁵, with emphasis on reuse and refurbishment of products, components, and materials, and must ensure that those with the greatest environmental burden or economic value are optimally managed throughout material recovery and disposal. Mass balance and tracking material and product flows through the program supply chain to their final reuse, refurbishment, recovery or disposal is considered necessary to meet these obligations.

Information Feedback Loop

An ideal used electronics management program enables continuous improvement in product design to minimize or eliminate components, materials or configurations that are difficult to process through proactive engagement between recyclers and design teams at original equipment manufacturers. This engagement must provide information and guidance regarding product design to improve responsible handling and processing of products, components, and materials at the end-of-life of the product as well as feedback regarding materials for which no economically viable market exists to enable maximum resource recovery.

Environmental Assessment

An ideal used electronics management program must engage with its downstream partners to understand and characterize the effects and minimize the impacts of the program it handles on the environment, at both a local and global scale.

⁵ The waste hierarchy defines the order in which electronic equipment reaching the end of its first useful life is handled. The hierarchy is: 1) prevention of waste generation; 2) preparation for refurbishing and reuse; 3) recycling; 4) incineration with state-of-the-art flue gas cleaning and energy recovery; 5) incineration with state-of-the-art flue gas cleaning without energy recovery; 6) disposal on landfill sites. (Waste Framework Directive, End-of-waste criteria. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Test with EEA relevance). OJ L 312, 22/11/2008. Retrieved from http://ec.europa.eu/environment/waste/framework/end_of_waste.htm.)

Annex A – Methodology, Scope, and Boundaries

An expert panel comprised of multiple stakeholder groups was brought together and surveyed using the Delphi method to develop the definition presented here. The Delphi method is an iterative process that queries a panel of experts (the Delphi panel) regarding a specific question and seeks consensus among panelists by providing them with an opportunity to express their opinion and then revise it based on the information provided by other expert panelists. In this case, experts from government agencies, manufacturing, non-government organizations, recycling facilities, and other interested groups provided their insights in a series of 5 surveys. After each survey, the research team provided a synthesis of the responses for review.

Electronic equipment management programs run by both original electronics manufacturers (OEMs) and other organizations are within the scope of this work, as well as programs that deal in IT or commercial electronic equipment (e.g., servers). Programs dealing with electrical equipment (e.g., white goods, small appliances) are not explicitly in scope. However, if electrical equipment programs collect electronics, they would be in scope for those product categories. The target audience for the Ideal Used Electronics Management Program Definition resulting from this effort is the individual or group within an organization that is responsible for implementing and executing a used electronics management program.

While the attributes of an ideal program considered in this work could be aspirational, they were bound by whether or not it was within the power of the target audience to implement the attribute. For example, redesigning products to optimize for disassembly may be desirable, but is typically outside the influence of a used electronics program manager. Enabling such redesign through the collection and dissemination of information regarding what features have the greatest influence on disassembly, however, is well within scope of that individual or organization, and therefore within the scope of this effort.

Defining product repair and reuse beyond the desirability of these actions as part of an ideal used electronics management program is not the focus of this work, especially in the context of business-to-business products and business models. This means that the definition, without further consideration of system or component reuse may be less than ideal for these types of organizations. Multiple efforts are underway to bring more clarity to this space and the definition provided here may be revisited depending on the outcomes of these efforts.

The work of the Delphi panel also included identification of potential metrics that could be used to assess a program's progress towards an ideal state. In addition to identifying potential metrics, the panel was asked to evaluate the appropriateness and feasibility of using those metrics. This metric list will be revisited in a subsequent project to determine the utility of the proposed metrics for assessing program effectiveness. Useful metrics for assessing a program's progress will be published at the completion of the second phase of this research.