



EWAsTER

Interreg
Euro-MED



Co-funded by
the European Union



Local Action Plan

Italy

**eWaster Project | Preventing e-waste from polluting
MED water by turning waste into a resource.**

<https://ewaster.interreg-euro-med.eu/>



Document Control Information

Document Title	Local Action Plan. Italy
Project Title	Preventing e-waste from polluting MED water by turning waste into a resource.
Project Mission	Strengthening an innovative sustainable economy
Programme Priority	Greener MED
Specific Objective	RSO2.6: Promoting the transition to a circular and resource efficient economy
Document Author	Marche Region and UCPB
Partners Involved	All project partners
Work Package	<Work Package 1, 2, or 3 title>
Activity	<AX.Y – Name of Activity>
Deliverable ID	<D.X.Y.Z – Name of Deliverable per JEMS>
Doc. Status	Version 6 del 27/03/2026
Sensitivity	Distributable
Date of Production	26703/2026

Document Approver(s) and Reviewer(s)

NOTE: All Approvers are required. Records of each approver must be maintained. All Reviewers in the list are considered required unless explicitly listed as Optional.

Name	Role	Action	Date
		<Approve / Review>	

Document History

Versions	Date	Document status	Delivered by
Version 1	09/01/2025	Index, draft	Marche Region
Version 2	17/02/2025	Draft, v2	Marche Region
Version 3	28/03/2025	Draft, v3	Marche Region
Version 4	26/05/2025	Draft, v4	Marche Region, UCPB
Version 5	26/06/2025	Draft, v5	Marche Region, UCPB
Version 6	27/03/2026	Draft, v6	Marche Region, UCPB





Table of Contents

Glossary	6
1. WEEE — Waste from Electrical and Electronic Equipment EXECUTIVE SUMMARY	7
2. ABBREVIATIONS	8
3. PURPOSE AND METHODOLOGY	9
4. INTRODUCTION TO THE TOPIC.....	11
4.1. Introduction to WEEE challenge.....	11
4.2. eWaster project.....	13
4.3. Introduction to main WEEE Waster key concept.....	13
5. BACKGROUND TO THE LOCAL ACTION PLAN.....	15
5.1. Introduction to Local Action Plan.....	15
5.2. Methodology to be implemented in eWaster.....	15
6. WEEE CONCEPTUAL FRAMEWORK	17
6.1. E-WASTE/WEEE CLASSIFICATION	17
6.2. EU classifications.....	17
6.3. Other classification system outside the EU	22
6.4. HS 2022 codes	26
6.5. Correlations between the classifications.....	27
7. ACTORS INVOLVED IN THE SYSTEM.....	29
7.1. Producers and producer responsibility organizations (PRO)	29
7.2. Extended Producer Responsibility (EPR)	30
7.3. Retailers.....	32
7.4. National competent authorities and Enforcement bodies.....	33
7.5. Coordination body.....	34
7.6. Local authorities	34
7.7. Other collection channels (e.g.B2B collection points, installers, demolition companies, social economy, etc)	35
7.8. Preparing for reuse organizations	35
7.9. WEEE treatment companies.....	36
7.10. Citizens/Business/Public sector-WEEE generators.....	37
8. STANDARD MONITORING SYSTEMS.....	38
8.1. POM	38
8.2. Life time	39
8.3. System of Environmental-Economic Accounting (SEEA)	40
8.4. Framework for the Development of Environment Statistics (FDES)	40
8.5. Stock (S).....	41
8.6. Formal collection of e-waste (Wformal)	41
9. THE AREA UNDER ANALYSIS	43
9.1. General Framework	43





9.1.1. Separate Collection, Preparation for Reuse, Recycling, and Waste Recovery	45
9.1.2. Legal Framework in Marche Region	47
9.2. Waste Management Plan(s)	49
9.2.1. Rates and figures related to the country and region	49
9.2.2. Regional status: Improvements and challenges	50
9.2.3. Collection network in Marche Region	51
9.2.4. Collection and processing of WEEE in Marche Region	51
9.3. ACTORS INVOLVED IN THE POLICY INSTRUMENT	52
9.3.1. Main actors in the policy	52
9.4. THE WEEE INDUSTRIAL AND ENVIRONMENTAL IMPACT ON THE POLICY AREA	53
9.4.1. The WEEE environmental impact on the policy area	53
9.4.2. The WEEE industrial sector on the policy area	53
10. THE EEE/WEEE ECONOMIC CONTEXT	55
10.1. EEE/WEEE BUSINESS ENVIRONMENT AND EMPLOYMENT	55
10.1.1. EU	55
10.2. EEE/WEEE EDUCATION, SKILLS AND CAPACITY BUILDING	56
10.2.1. EU	56
11. THE STRATEGIC AND POLICY CONTEXT	58
11.1. EU POLICY CONTEXT	58
11.1.1. WEEE EU POLICY	58
11.2. NATIONAL, REGIONAL AND LOCAL POLICIES	64
11.3. IMPLEMENTATION LEVEL OF POLICIES	80
11.3.1. Collection rates (EU)	80
11.3.2. Problems, barriers, achievements (EU)	81
12. POLICY BEST SAMPLES ON WEEE MANAGEMENT	86
12.1. Policy samples for increasing collection	86
12.2. Policy samples for recycling, up-cycling, repairing and second life	98
13. INDICATORS BENCHMARKING AND CONVERGING MEDITERRANEAN POLICY	109
13.1. KPIs to be achieved	109
13.2. Proposals of improvements at local and regional level	111
14. WP3 EWASTER SOLUTIONS ENDORSEMENT AND TRANSFER FRAMEWORK	113
14.1. Purpose of the WP3 Consolidation	113
14.2. Evidence from WP2 Pilot Solutions	113
14.3. Selection of Solutions for Endorsement	114
14.4. Conditions for Future Adoption	114
14.5. Stakeholder Alignment and Governance Pathway	115
14.6. Endorsement Statement	115
15. CONCLUSIONS	117





16. REFERENCES.....	118
Annexes.....	120
Annex 1 – Annex Title.....	120





Glossary

EC – European Commission

EU – European Union

LAP – Local Action Plan

MED – Mediterranean

MED Methodology – Transnational Methodology for e-waste Prevention and Management





1. WEEE — Waste from Electrical and Electronic Equipment

EXECUTIVE SUMMARY

The document presents a thorough evaluation of Waste Electrical and Electronic Equipment (WEEE) management in the Marche Region, emphasizing market trends and effective operational practices. It offers a detailed overview of the current landscape of e-waste handling within the region, highlighting the integration of cutting-edge technologies and regulatory measures aimed at strengthening waste management systems.

The increasing reliance on electronic devices in daily life has brought with it a growing problem: the rapid accumulation of electronic waste, or e-waste. As technology evolves and older devices are discarded, the need for environmentally responsible waste management becomes more urgent. In response, the eWAsTER project, supported by the Interreg Euro-Med program, has been launched to tackle this issue through collaboration across eight European regions.

The core aim of eWAsTER is to align local and regional waste management policies with the objectives of the EU Circular Economy Action Plan. The project advocates for a shift away from the traditional linear economic model—based on consumption and disposal—toward a circular approach that prioritizes reuse, resource efficiency, and smart recycling systems. In doing so, eWAsTER contributes significantly to rethinking how electronic waste is managed across Europe.

More than a regulatory initiative, eWAsTER fosters regional collaboration by encouraging the exchange of expertise, experiences, and best practices. This knowledge-sharing framework enables participating regions to tailor effective strategies to their specific circumstances, strengthening their capacity to implement sustainable e-waste solutions. Its cooperative structure ensures that the project's benefits are both far-reaching and locally relevant, supporting the development of more robust circular economy practices throughout the continent.

Key partners such as UCPB and the Marche Region play a pivotal role in the initiative by assisting companies in repairing and reusing electronic equipment—critical components of a circular system. Through these efforts, eWAsTER not only bridges existing policy gaps but also translates the principles of the circular economy into real-world environmental and socio-economic advancements.

In summary, the document underscores the importance of collaborative action among key stakeholders—including retailers, local governments, recycling firms, and non-profit organizations—to enhance WEEE collection and processing systems in the Marche Region. By fostering partnerships and supporting forward-looking initiatives, the region is positioned to address both environmental and social challenges while advancing toward a more sustainable future.





2. ABBREVIATIONS

AP	Action Plan
BP	Best Practices
CPU	Central Processing Unit
CWC	Chemical Weapons Convention
EC	European Commission
EEE	Electrical and Electronic Equipment
EP	European Parliament
EPR	Extended Producer Responsibility
ERDF	European Regional Development Fund
EU	European Union
E-waste	Electronic waste
HS	Harmonized System
KPI	Key Performance Indicator
LAP	Local Action Plan
LoW	European List of Wastes
OECD	Organization for Economic Co-operation and Development
POM	Put on Market
PRO	Producer Responsibility Organization
RoHS	Restriction of the use of certain Hazardous Substances in electrical and electronic equipment
TBD	Take-back scheme
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UCPB	Unione Pian del Bruscolo - Union of the Municipalities Pian del Bruscolo
WCO	World Customs Organization
WEEE	Waste Electrical and Electronic Equipment



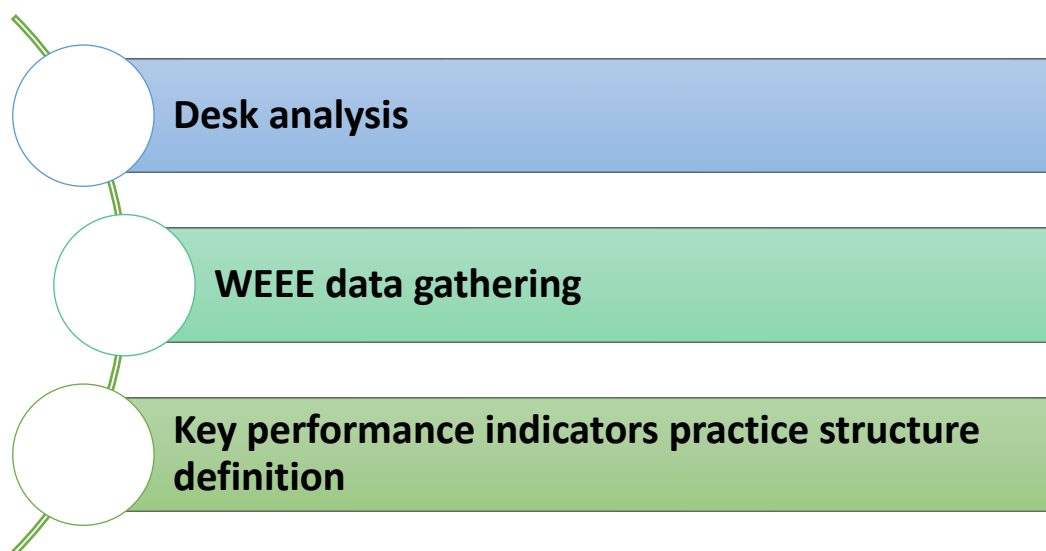
3. PURPOSE AND METHODOLOGY

The Local Action Plan (LAP) for the management of Waste Electrical and Electronic Equipment (WEEE) outlines a targeted strategy to address electronic waste at the community level. Its primary aim is to foster environmentally sound practices through the responsible collection, treatment, and disposal of e-waste, with a strong emphasis on minimizing ecological and health risks. A major priority is the recovery and reuse of valuable materials—such as metals and plastics—to feed back into production cycles and reinforce the shift toward a circular economy.

A cornerstone of the plan is raising public and stakeholder awareness about the significance of proper e-waste handling. By encouraging citizen participation in collection schemes and outreach efforts, the plan promotes more mindful disposal habits. It also ensures that local initiatives are harmonized with broader legislative standards, including the WEEE Directive and the Basel Convention, aligning local action with national and international policy frameworks.

To ensure effective delivery, the plan calls for collaboration across sectors—involving municipal authorities, producers, recyclers, and the wider community. This integrated approach supports the development of Extended Producer Responsibility (EPR) mechanisms and stimulates green economic growth by driving innovation in recycling technologies and creating sustainable employment opportunities.

The development of the LAP begins with a comprehensive baseline analysis to assess the types, volumes, and sources of local e-waste. It includes an evaluation of existing collection and processing systems, identifying infrastructure gaps, policy deficiencies, and areas where public understanding is lacking. Through inclusive workshops and stakeholder dialogues, these challenges are jointly addressed, resulting in solutions tailored to the specific local context.



The plan is structured around a clear strategic framework, featuring targeted objectives, regulatory measures, and financing pathways. It defines precise, actionable goals and points to funding sources such as municipal budgets, EPR contributions, and external grants. Priority actions include enhancing WEEE collection and recycling infrastructure, launching targeted educational campaigns, and introducing digital tools for tracking the flow and treatment of electronic waste.

Implementation is phased across short-, medium-, and long-term timelines, with responsibilities clearly assigned to relevant actors. To reinforce successful execution, the





plan incorporates training and capacity-building initiatives, ensuring personnel are equipped with the skills and knowledge to apply best practices. Progress is tracked through key performance indicators (KPIs), alongside regular evaluations and transparent reporting mechanisms to maintain momentum and accountability.

With its comprehensive and adaptable structure, the LAP provides a sustainable pathway for managing e-waste. It supports environmental protection, safeguards public health, and contributes to local economic resilience. Designed to reflect local realities and capacities, it offers a long-term vision for building a more circular and responsible approach to electronic waste management.



4. INTRODUCTION TO THE TOPIC

4.1. Introduction to WEEE challenge

Electrical and electronic equipment (EEE)—from everyday household items like washing machines and vacuum cleaners to essential personal gadgets such as smartphones and laptops—has become integral to contemporary life. These devices support countless aspects of daily activity, making modern living virtually dependent on their functionality.

Once these devices reach the end of their operational life, they become Waste Electrical and Electronic Equipment (WEEE), more commonly referred to as e-waste. The emphasis on "waste" underscores that these items are no longer functional or desired and must be discarded through appropriate and sustainable channels. WEEE encompasses a broad spectrum of electrically powered products used in homes and businesses, many of which contain sensitive electronic components.

The management of e-waste has become increasingly complex across Europe due to the sheer volume of outdated and discarded electronics. One of the key challenges lies in WEEE's intricate composition: it combines hazardous substances—such as brominated flame retardants (BFRs) and polychlorinated biphenyls (PCBs)—with valuable materials, including rare earth elements and precious metals. Proper handling is essential to mitigate health and environmental risks, as well as to facilitate the recovery of critical raw materials.

Typically, electronic equipment is composed of materials like iron, copper, aluminum, plastics, and glass, all of which vary in proportion depending on the product. This material mix highlights the necessity for efficient and well-structured waste management systems that prioritize recycling and reuse.



Evolution of e-products in the last century

To address these challenges, Europe has implemented a strong legislative framework to govern WEEE. These regulations aim to minimize environmental impacts while advancing the principles of a circular economy. Clear standards have been established for the collection, treatment, and recycling of e-waste, with particular attention to the safe management of toxic components and the retrieval of reusable resources.

Despite this overarching regulatory structure, the effectiveness of WEEE management varies considerably across regions and countries. Differences in infrastructure, recycling capabilities, and stakeholder participation affect the success of implementation, resulting





in inconsistent performance across the EU. These disparities represent a persistent barrier to achieving harmonized and high-performing e-waste systems throughout the continent.

To confront the mounting issue of electronic waste, the European Parliament introduced the WEEE Directive (2002/96/EC) in February 2003. Its key objectives were to:

- Prevent and reduce the production of e-waste,
- Promote the reuse, recycling, and recovery of electrical devices,
- Ensure responsible disposal practices.

This initial directive was later updated with Directive 2012/19/EU, which came into force on August 13, 2012. The revised version intensified the focus on sustainable consumption and production, with an emphasis on preventing e-waste generation at the source. It also set more ambitious targets for recycling and recovery, aiming to reduce reliance on landfills, improve material efficiency, and reclaim secondary raw materials vital for European industries.

Moreover, the directive reinforces the environmental responsibilities of all stakeholders in the product lifecycle—from manufacturers and distributors to consumers and waste processors. It mandates that those handling the collection and treatment of WEEE do so in a way that ensures environmental safety, efficiency, and long-term sustainability.





4.2. eWAsTER project

The “Preventing e-waste from polluting MED water by turning waste into a resource (eWAsTER)” project is co-funded by the European Union (Interreg Euro-Med project) consisting of 10 partners from 8 European countries namely:

- Portugal: Parque do Alentejo de Ciência e Tecnologia (PACT)
- Greece: Rethymno Municipality
- Italy: Marche Region
- Slovenia: Environmental Research Institute (ORZ)
- Bosnia and Herzegovina: Neum Municipality
- Bulgaria: Union of Bulgarian Black Sea Local Authorities
- Italy: Union of the Municipalities Pian del Bruscolo (UCPB)
- Spain: Provincial Waste Consortium of Malaga (RSU Malaga)
- Bosnia and Herzegovina: Association LINK Entrepreneurial Center (LINK)
- Cyprus: Aradippou Municipality

The project eWAsTER aims to promote local and regional policies for better e-waste management, to reduce e-waste environmental damage in the selected areas, while promoting new innovative eco-business models based on the conversion of the currently linear electrical and electronic (E&E) sector into a sustainable circular model.

There are three main Work Packages (WP) which are briefly described as follows:

- WP1: To create local and regional Action Plans for e-waste prevention and management, based on the project self-assessment tools and the project “Methodology for designing Strategies for Mediterranean e-waste prevention and management”
- WP2: To demonstrate and test the feasibility and effectiveness of 8 innovative solutions selected from the 8 consortium LAPs, providing validation at small scale prior to applying the solution at full scale and to transfer them to the programme Area.

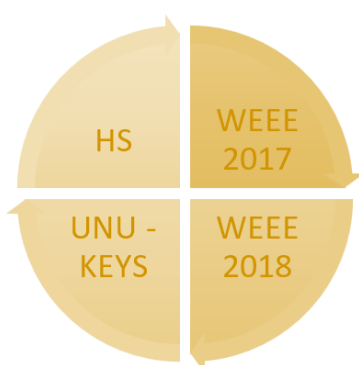
WP3: To enlarge the number of institutions up-scaling tested solutions from WP2, and increase the number of institutions using the project tools to create new Action Plans and Strategies for Mediterranean e-waste prevention and management.

4.3. Introduction to main WEEE Waster key concept

Before examining the various factors that influence WEEE management at both national and local levels, it's essential to clarify a few key terms and concepts that underpin the development of this Action Plan. WEEE classification is based on systems created by the European Union and international bodies. The WEEE 2017 and 2018 classifications, developed under the EU WEEE Directives, organize electronic and electrical equipment into specific categories to standardize management across member states.

The UNU-KEYS system, created by the United Nations University, groups products based on similar functions, materials, and end-of-life characteristics, facilitating better analysis and tracking. Additionally, HS 2022 codes—harmonized global trade classifications—help countries align with international waste regulations like the Basel Convention and connect with the CPC system to maintain consistency in reporting and policy alignment.



*WEEE Classification: Source own*

Effective e-waste monitoring relies on a variety of tools and methods, particularly within the European Union. These systems are essential for collecting reliable data, assessing performance, and shaping policy. Understanding how WEEE is categorized and tracked provides a foundation for more strategic and efficient management practices.

WEEE management involves a wide range of stakeholders, including producers, consumers, governmental agencies, and enforcement bodies. A persistent issue in many EU countries is the imbalance in responsibilities across the value chain. Producer Responsibility Organizations (PROs) and manufacturers are typically held accountable for meeting national recycling and collection targets. However, they often lack access to the full spectrum of waste streams, as much e-waste is managed outside official systems. This disconnect has led, in some cases, to penalties for PROs, despite their limited ability to influence outcomes directly.

Since their creation, PROs—representing over 31,000 brands—have collaborated with logistics and recycling companies to collect, process, and safely treat nearly 26 million tonnes of e-waste, maintaining high environmental and technical standards. Eurostat data shows that WEEE collection across the EU rose from 3 million tonnes in 2012 to 4.9 million tonnes in 2021, indicating steady progress. A central player in this progress is the WEEE Forum, the largest global network of PROs, which manages an extensive system of more than 114,000 collection points across Europe, reflecting the broad scope and reach of formal e-waste infrastructure.

Clarifying these terms and relationships helps establish a solid foundation for the policies and strategies that follow in this Action Plan.



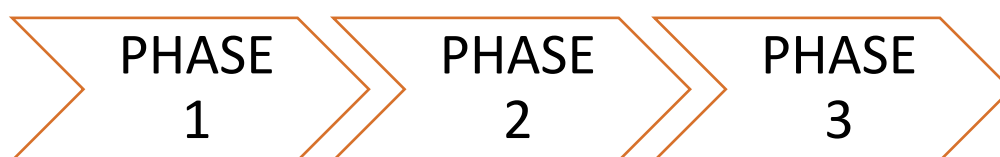
5. BACKGROUND TO THE LOCAL ACTION PLAN

5.1. Introduction to Local Action Plan

Managing Authorities are responsible for improving WEEE management strategies at the national, regional, and local levels, ensuring alignment with the European Union's Circular Electronics Initiative, a core element of the broader Circular Economy Action Plan. This work begins with a detailed analysis of the current WEEE management framework in the target area. Within the eWAsTER project, this initial step—referred to as the "Action Plan"—functions as a benchmarking or state-of-the-art assessment. It includes comparisons with neighbouring regions to identify gaps or irregularities that could facilitate illegal transfers of e-waste. A key component of this phase (Phase 1) is a SWOT analysis to better understand the strengths, weaknesses, opportunities, and threats associated with local WEEE management.

WEEE policy implementation is shaped by a range of interconnected challenges. Local authorities must manage diverse technical, regulatory, financial, and awareness-related factors, all of which impact how systems are structured and how effectively collection, sorting, and treatment are carried out. These local and national dynamics will significantly influence both the design and relevance of the Action Plan, as well as the KPIs used to track progress.

The findings generated in this first phase will feed directly into the Action Plan and serve as the foundation for the Pilot Action. The pilot will act as both a testing ground and feedback mechanism, helping refine and validate the Plan. Drawing on insights from the sectoral analysis, the Action Plan will propose updated policy tools and define a set of targeted, actionable steps for implementation in Phase 2.



5.2. Methodology to be implemented in eWAsTER

The Action Plan was developed through a structured, multi-phase methodology that combined data collection, analysis, validation, and finalization, all aligned with the goals of the relevant Policy Instruments. To ensure technical robustness and contextual relevance, all data and findings underwent expert and stakeholder review before being integrated into the final version of the plan.

The process started with a desk-based analysis using macro-level data drawn from national and European statistical sources, as well as sector-specific publications. This phase provided an overview of economic dynamics, education levels, industrial developments, and, in some cases, energy consumption and market structure. It also involved mapping existing EU, national, and regional policies, assessing their targets and the extent to which they have been met.

This was followed by sector-focused research and local data collection using tailored tools to capture more detailed, context-specific information. These insights played a crucial role in developing preliminary Key Performance Indicators (KPIs) to measure the effectiveness of WEEE management strategies. As new data became available, these indicators were adjusted and refined accordingly.

The draft Action Plan was built around this data and included the initial KPI framework and a comprehensive SWOT analysis. It was then presented to relevant stakeholders for





consultation and validation. Their input helped ensure the plan was grounded in practical realities and capable of driving tangible improvements.

The insights from this entire process directly inform the upcoming Pilot Action, which is designed to respond to the unique challenges and opportunities of the region's WEEE landscape. In the end, the Action Plan aims to identify critical challenges, existing resources and stakeholders, and propose innovative and practical approaches to enhance WEEE management.



6. WEEE CONCEPTUAL FRAMEWORK

6.1. E-WASTE/WEEE CLASSIFICATION

Before presenting the measurement framework, it's important to first address how e-waste is classified. E-waste encompasses all types of discarded electrical and electronic equipment (EEE), along with their components, that are no longer intended for use by the owner. Given the vast diversity of EEE types, a structured classification system is essential for effective management.

Multiple classification systems exist, each offering benefits for data collection and statistical analysis within monitoring frameworks. However, maintaining consistency and comparability across systems requires adherence to certain standards. These standards are critical to developing strong, harmonized indicators that can be used in both national reporting and international benchmarking.

A balanced approach is key. Classifications that are overly detailed—especially for equipment with low environmental impact, little recoverable value, or minimal market presence—can overwhelm data collection systems and impose an unnecessary burden on those reporting the data. On the other hand, if classifications are too broad, they fail to capture meaningful differences in e-waste composition and treatment across countries, leading to lower data quality and limited policy relevance.

Currently, the two most widely used systems are those defined in the EU Directives—both the versions in place before and after 2017—and the UNU (United Nations University) classification. Each provides a useful framework, and selecting the appropriate system depends on the specific goals of the measurement process and the context in which it is applied.



Eu directives WEEE classifications: Source: Own

6.2. EU classifications

European List of Wastes

The European List of Wastes (LoW) functions as the EU's official waste classification system, primarily designed for administrative use—such as permitting, compliance monitoring, and regulatory reporting. Many EU countries, as well as some nations in the Caucasus and Central Asia, use this list as the basis for assembling national waste statistics, which are typically compiled and reported in aggregated categories based on waste type.

The LoW includes 839 waste types, structured into 20 chapters. These chapters are largely organized by the origin of the waste, generally linked to the sector or process that produced



it. Each waste type is assigned a unique six-digit code. Instructions for assigning waste to these categories can be found in the introduction to Decision 2000/532/EC, with further clarification provided in a supporting guidance document. Of these waste types, 13 specific codes relate to electrical and electronic waste (e-waste), and each is designated as either hazardous or non-hazardous, as shown in Table 2 (not included here). It's worth noting that waste generated from the treatment of e-waste—such as plastic fragments, metals, or lead-containing glass—is not classified under these codes.

The LoW codes relevant to e-waste are relatively general and best suited for tracking separately collected waste streams. However, they lack the granularity needed for detailed statistical reporting. These broad classifications do not account for the wide variation in e-waste types, which differ significantly in terms of environmental risk and recycling potential. As a result, much e-waste is often inaccurately reported under unrelated categories, such as general municipal waste or scrap metal.

Currently, e-waste data collection in EU Member States is governed by the WEEE Directive, which mandates reporting across 10 defined categories of electronic and electrical waste. These categories allow for a more detailed understanding of e-waste flows and support better-informed policy decisions for sustainable management:

Large house hold appliances

Large cooling appliances; Refrigerators; Freezers; Other large appliances used for refrigeration, conservation and storage of food; Washing machines; Clothes dryers; Dish washing machines; Cookers Electric stoves; Electric hot plates; Microwaves; Other large appliances used for cooking and other processing of food; Electric heating appliances; Electric radiators; Other large appliances for heating rooms, beds, seating furniture; Electric fans; Air conditioner appliances; Other fanning, exhaust ventilation and conditioning equipment

Small household appliances

Vacuum cleaners; Carpet sweepers; Other appliances for cleaning; Appliances used for sewing, knitting, weaving and other processing for textiles; Irons and other appliances for ironing, mangling and other care of clothing; Toasters; Fryers; Grinders, coffee machines and equipment for opening or sealing containers or packages; Electric knives; Appliances for hair cutting, hair drying, tooth brushing, shaving, massage and other body care appliances; Clocks, watches and equipment for the purpose of measuring, indicating or registering time; Scales

IT & Telecommunications equipment

Centralised data processing;; Mainframes; Minicomputers; Printer units; Personal computing; Personal computers (CPU, mouse, screen and keyboard included); Laptop computers (CPU, mouse, screen and keyboard included); Notebook computers; Notepad computers; Printers; Copying equipment; Electrical and electronic typewriters; Pocket and desk calculators and other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means; User terminals and systems; Facsimile machine (fax); Telex; Telephones; Pay telephones; Cordless telephones; Cellular telephones; Answering systems and other products or equipment of transmitting sound, images or other information by telecommunications

Consumer equipment

Radio sets; Television sets; Video cameras; Video recorders; Hi-fi recorders; Audio amplifiers; Musical instruments and other products or equipment for the purpose of recording or reproducing sound or images, including signals or other technologies for the distribution of sound and image than by telecommunications; Photovoltaic panels



Lighting equipment

Luminaires for fluorescent lamps with the exception of luminaires in households; Straight fluorescent lamps; Compact fluorescent lamps; High intensity discharge lamps, including pressure sodium lamps and metal halide lamps; Low pressure sodium lamps; Other lighting or equipment for the purpose of spreading or controlling light with the exception of filament bulbs

Electrical & Electronic Tools (with exception to large scale stationary Industrial Tools)

Drills; Saws; Sewing machines; Equipment for turning, milling, sanding, grinding, sawing, cutting, shearing, drilling, making holes, punching, folding, bending or similar processing of wood, metal and other materials; Tools for riveting, nailing or screwing or removing rivets, nails, screws or similar uses; Tools for welding, soldering or similar use; Equipment for spraying, spreading, dispersing or other treatment of liquid or gaseous substances by other means; Tools for mowing or other gardening activities

Toys leisure and sports equipment

Electric trains or car racing sets; Hand-held video game consoles; Video games Computers for biking, diving, running, rowing, etc; Sports equipment with electric or electronic components; Coin slot machines

Medical Devices (with exception of all implanted and infected products)

Radiotherapy equipment; Cardiology equipment; Dialysis equipment; Pulmonary ventilators nuclear medicine equipment; Laboratory equipment for in vitro diagnosis; Analysers; Freezers; Fertilization tests; Other appliances for detecting, preventing, monitoring, treating, alleviating illness, injury or disability

Monitoring & control instruments

Smoke detector; Heating regulators; Thermostats; Measuring, weighing or adjusting appliances for household or as laboratory equipment; Other monitoring and control instruments used in industrial installations (e.g., in control panels)

Automatic dispensers

Automatic dispensers for hot drinks; Automatic dispensers for hot or cold bottles or cans; Automatic dispensers for solid products; Automatic dispensers for money; All appliances which deliver automatically all kinds of products

As of 15 August 2018, the revised WEEE Directive specifies six categories to be reported, reflecting the actual streams through which e-waste is collected in practice. These categories include:

Group of EEE	Details
1	Temperature exchange equipment Refrigerators, Freezers, Equipment which automatically delivers cold products, Air conditioning equipment, Dehumidifying equipment, Heat pumps, Radiators containing oil and other temperature exchange equipment using fluids other than water for the temperature exchange.
2	Screens, monitors, and equipment containing screens having a surface greater than 100 cm ²



	Screens, Televisions, LCD photo frames, Monitors, Laptops, Notebooks.
3	Lamps Straight fluorescent lamps, Compact fluorescent lamps, Fluorescent lamps, High intensity discharge lamps - including pressure sodium lamps and metal halide lamps, Low pressure sodium lamps, LED.
4	Large equipment Washing machines, Clothes dryers, Dish washing machines, Cookers, Electric stoves, Electric hot plates, Luminaires, Equipment reproducing sound or images, Musical equipment (excluding pipe organs installed in churches), Appliances for knitting and weaving, Large computer-mainframes, Large printing machines, Copying equipment, Large coin slot machines, Large medical devices, Large monitoring and control instruments, Large appliances which automatically deliver products and money, Photovoltaic panels.
5	Small equipment Vacuum cleaners, Carpet sweepers, Appliances for sewing, Luminaires, Microwaves, Ventilation equipment, Irons, Toasters, Electric knives, Electric kettles, Clocks and Watches, Electric shavers, Scales, Appliances for hair and body care, Calculators, Radio sets, Video cameras, Video recorders, Hi-fi equipment, Musical instruments, Equipment reproducing sound or images, Electrical and electronic toys, Sports equipment, Computers for biking, diving, running, rowing, etc., Smoke detectors, Heating regulators, Thermostats, Small Electrical and electronic tools, Small medical devices, Small Monitoring and control instruments, Small Appliances which automatically deliver products, Small equipment with integrated photovoltaic panels.
6	Small IT and telecommunication equipment (no external dimension more than 50 cm) Mobile phones, GPS, Pocket calculators, Routers, Personal computers, Printers, Telephones.

As of August 15, 2018, the scope has been substantially changed by dividing electrical and electronic equipment into six replacement categories from the previous ten. The main novelty consists in the transition from a "closed" scope of application, limited to specific product categories, to an "open" one: the Open Scope. A comparison between the two definitions of the scope is shown in the table.

THE TEN CATEGORIES OPEN SCOPE

Period of validity	Until 14 August 2018	From 15 August 2018
Number of categories	10	6
Principle of Category Identification	Merchandise	Dimensional
Typology of the scope	Closed	Open





Equipment covered by WEEE regulations	Electrical and electronic equipment identified by the ten categories	All EEE as defined in Article 4, paragraph 1, letter a) of Legislative Decree 49/2014 ¹¹
Description of the scope	The equipment that must be treated according to the WEEE regulations are exclusively those falling within the ten categories for which the scope of application is "closed" and limited to the aforementioned specific product classes	All electrical and electronic equipment must be treated as WEEE at the end of its life ¹² . Categorization does not limit the scope, as two of them are defined according to a dimensional principle that keeps them open and expandable

EU Member States are required to meet collection targets that are defined either as a percentage of the Electrical and Electronic Equipment (EEE) placed on the market (POM) in the past three years or as a percentage of the e-waste actually generated. This transition from fixed collection goals to relative targets underscores the importance of having more precise and comprehensive data on e-waste flows.

EEE CATEGORY UNDER EU-6 (2018)	EEE CATEGORY UNDER EU-10 (2017)
Lamps	Lighting equipment
Large equipment	Large household appliances
Large equipment	Consumer equipment
Large equipment	IT and telecommunications equipment
Large equipment	Electrical and electronic tools
Large equipment	Toys
Large equipment	Medical devices
Large equipment	Monitoring and control instruments
Large equipment	Automatic dispensers
Screens and monitors	IT and telecommunications equipment
Screens and monitors	Consumer equipment
Small equipment	Large household appliances
Small equipment	Small household appliances
Small equipment	Consumer equipment
Small equipment	Lighting equipment
Small equipment	Electrical and electronic tools
Small equipment	Toys
Small equipment	Medical devices



Small equipment	Monitoring and control instruments
Small IT	IT and telecommunications equipment
Small IT	Toys
Temperature exchange equipment	Large household appliances
Temperature exchange equipment	Automatic dispensers

Category	Q1 2021 WEEE collections	Q1 2022 WEEE collections	Q1 2023 WEEE collections	Progress toward 2023 target
1. Large household appliances	47,635	45,407	44,260	27%
2. Small household appliances	7,499	8,291	8,226	25%
3. IT and telecoms equipment	8,272	9,200	9,670	26%
4. Consumer equipment	5,024	5,414	5,069	24%
5. Lighting equipment	1,256	1,288	1,341	26%
6. Electrical and electronic tools	5,476	5,621	6,029	26%
7. Toys, leisure and sports	1,077	1,138	1,208	26%
8. Medical devices	1	1	3	27%
9. Monitoring and control instruments	278	245	265	24%
10. Automatic dispensers	0	1	0	0%
11. Display equipment	9,866	10,558	11,046	27%
12. Cooling appliances	33,184	31,624	32,208	24%
13. Gas discharge lamps and LED light sources	922	1,033	1,026	25%
14. Photovoltaic panels	64	50	80	26%
TOTAL	120,554	119,871	120,433	26%

EEE data collection. Source: 2bcompliance.org.uk/news/q1-2023-weee-data-shows-promising-collection-figures/

6.3. Other classification system outside the EU

Classification of e-waste under the Basel Convention

Article 2 ("Definitions") of the Basel Convention defines waste as "substances or objects which are disposed of, intended to be disposed of, or required to be disposed of under national legislation." Furthermore, paragraph 4 of the same article describes disposal as "any operation listed in Annex IV" of the Convention.

UNU-KEYS

The UNU-KEYS system organizes product groups so that they share similar average weights, material compositions, end-of-life traits, and lifespan patterns, making it particularly useful for compiling e-waste statistics. The full list of UNU-KEYS categories is shown in Table 1, featuring 54 product types grouped into 10 main categories that correspond to those in the original EU Waste Electrical and Electronic Equipment (WEEE) Directive (see the fourth column of Table 1). Moreover, the classification aligns with the updated reporting categories introduced by the recast WEEE Directive, which came into effect in the EU in August 2018 (refer to the third column in Table 1). Acting as a practical link between the original EU classifications and other existing systems, the UNU-KEYS framework is also cited in implementing legislation to establish the common methodology for calculating WEEE collection targets under Article 7 (European Commission, 2017/2018).

UNU-KEY	DESCRIPTION	EEE CATEGORY UNDER EU-6	EEE CATEGORY UNDER EU-10
0001	Central Heating (household installed)	Large equipment	Large household appliances





0002	Photovoltaic Panels (incl. inverters)	Large equipment	Consumer equipment
0101	Professional Heating & Ventilation (excl. cooling equipment)	Large equipment	Large household appliances
0102	Dishwashers	Large equipment	Large household appliances
0103	Kitchen equipment (e.g., large furnaces, ovens, cooking equipment)	Large equipment	Large household appliances
0104	Washing Machines (incl. combined dryers)	Large equipment	Large household appliances
0105	Dryers (wash dryers, centrifuges)	Large equipment	Large household appliances
0106	Household Heating & Ventilation (e.g. hoods, ventilators, space heaters)	Large equipment	Large household appliances
0108	Fridges (incl. combi-fridges)	Temperature exchange equipment	Large household appliances
0109	Freezers	Temperature exchange equipment	Large household appliances
0111	Air Conditioners (household installed and portable)	Temperature exchange equipment	Large household appliances
0112	Other cooling equipment (e.g. dehumidifiers, heat pump dryers)	Temperature exchange equipment	Large household appliances
0113	Professional cooling equipment (e.g. large air conditioners, cooling displays)	Temperature exchange equipment	Large household appliances
0114	Microwaves (incl. combined, excl. grills)	Small equipment	Large household appliances
0201	Other small household equipment (e.g. small ventilators, irons, clocks, adapters)	Small equipment	Small household appliances
0202	Equipment for food preparation (e.g. toaster, grills, food processing, frying pans)	Small equipment	Small household appliances
0203	Small household equipment for hot water preparation (e.g. coffee, tea, water cookers)	Small equipment	Small household appliances
0204	Vacuum Cleaners (excl. professional)	Small equipment	Small household appliances





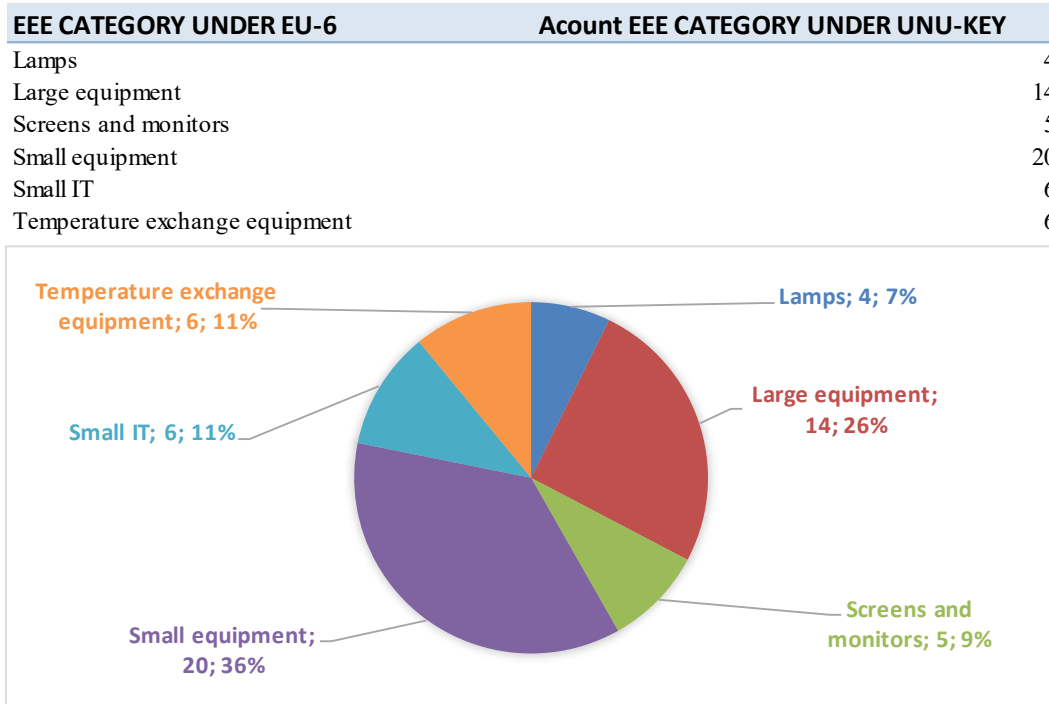
0205	Personal Care equipment (e.g. toothbrushes, hairdryers, razors)	Small equipment	Small household appliances
0301	Small IT equipment (e.g. routers, mice, keyboards, external drives & accessories)	Small IT	IT and telecommunications equipment
0302	Desktop PCs (excl. monitors, accessories)	Small IT	IT and telecommunications equipment
0303	Laptops (incl. tablets)	Screens and monitors	IT and telecommunications equipment
0304	Printers (e.g. scanners, multi - functionals, faxes)	Small IT	IT and telecommunications equipment
0305	Telecommunication equipment (e.g. cordless phones, answering machines)	Small IT	IT and telecommunications equipment
0306	Mobile Phones (incl. smartphones, pagers)	Small IT	IT and telecommunications equipment
0307	Professional IT equipment (e.g. servers, routers, data storage, copiers)	Large equipment	IT and telecommunications equipment
0308	Cathode Ray Tube Monitors	Screens and monitors	IT and telecommunications equipment
0309	Flat Display Panel Monitors (LCD, LED)	Screens and monitors	IT and telecommunications equipment
0401	Small Consumer Electronics (e.g. headphones, remote controls)	Small equipment	Consumer equipment
0402	Portable Audio & Video (e.g. MP3, e-readers, car navigation)	Small equipment	Consumer equipment
0403	Music Instruments, Radio, Hi-Fi (incl. audio sets)	Small equipment	Consumer equipment
0404	Video (e.g. Video recorders, DVD, Blue Ray, set-top boxes) and projectors	Small equipment	Consumer equipment
0405	Speakers	Small equipment	Consumer equipment
0406	Cameras (e.g. camcorders, photo & digital still cameras)	Small equipment	Consumer equipment
0407	Cathode Ray Tube TVs	Screens and monitors	Consumer equipment



0408	Flat Display Panel TVs (LCD, LED, Plasma)	Screens and monitors	Consumer equipment
0501	Small lighting equipment (excl. LED & incandescent)	Small equipment	Lighting equipment
0502	Compact Fluorescent Lamps (incl. retrofit & non-retrofit)	Lamps	Lighting equipment
0503	Straight Tube Fluorescent Lamps	Lamps	Lighting equipment
0504	Special Lamps (e.g. professional mercury, high & low pressure sodium)	Lamps	Lighting equipment
0505	LED Lamps (incl. retrofit LED lamps)	Lamps	Lighting equipment
0506	Household Luminaires (incl. household incandescent fittings & household LED luminaires)	Small equipment	Lighting equipment
0507	Professional Luminaires (offices, public space, industry)	Small equipment	Lighting equipment
0507	Professional Luminaires (offices, public space, industry)	Small equipment	Lighting equipment
0601	Household Tools (e.g. drills, saws, high pressure cleaners, lawn mowers)	Small equipment	Electrical and electronic tools
0602	Professional Tools (e.g. for welding, soldering, milling)	Large equipment	Electrical and electronic tools
0701	Toys (e.g. car racing sets, electric trains, music toys, biking computers, drones)	Small equipment	Toys
0702	Game Consoles	Small IT	Toys
0703	Leisure equipment (e.g. sports equipment, electric bikes, juke boxes)	Large equipment	Toys
0801	Household medical equipment (e.g. thermometers, blood pressure meters)	Small equipment	Medical devices
0802	Professional medical equipment (e.g. hospital, dentist, diagnostics)	Large equipment	Medical devices
0901	Household Monitoring & Control equipment (alarm, heat, smoke, excl. screens)	Small equipment	Monitoring and control instruments
0902	Professional Monitoring & Control equipment (e.g. laboratory, control panels)	Large equipment	Monitoring and control instruments



1001	Non- cooled Dispensers (e.g. for vending, hot drinks, tickets, money)	Large equipment	Automatic dispensers
1002	Cooled Dispensers (e.g. for vending, cold drinks)	Temperature exchange equipment	Automatic dispensers



EEE category under EU-6. Source: Own

6.4. HS 2022 codes

The World Customs Organisation (WCO) has amended and revised HS 2022, the seventh edition of the Harmonised System (HS) nomenclature that came into force on 1 January 2022.



WORLD CUSTOMS ORGANIZATION



The new HS2022 edition makes some major changes to the Harmonised System with a total of 351 sets of amendments covering a wide range of goods moving across borders

Increased visibility of a number of high-profile product streams feature in the 2022 Edition, recognising the changing trade patterns. Electrical and electronic waste, commonly referred to as e-waste, is one example of a product class which presents significant policy concerns as well as a high value of trade, hence HS 2022 includes specific provisions for its classification to assist countries in their work under the Basel Convention.

Other changes include new provisions for novel tobacco and nicotine-based products, specific provisions for unmanned aerial vehicles (UAVs), commonly referred to as drones, and smartphones will gain their own subheading.

Major reconfigurations have been undertaken for the subheadings of heading 70.19 for glass fibres and articles thereof and for heading 84.62 for metal forming machinery. These changes recognise that the current subheadings do not adequately represent the technological advances in these sectors, leaving a lack of trade statistics important to the industries and potential classification difficulties.

Protection of society and the fight against terrorism are increasingly important roles for Customs and goods specifically controlled under various Conventions have also been updated. The HS 2022 Edition introduces new subheadings for certain persistent organic pollutants (POPs) controlled under the Stockholm Convention, specific chemicals controlled under the Chemical Weapons Convention (CWC) and for certain hazardous chemicals controlled under the Rotterdam Convention.

The WCO, established in 1952, is an independent intergovernmental body whose mission is to enhance the effectiveness and efficiency of Customs administrations and represents 183 Customs administrations across the globe that collectively process approximately 98% of world trade.

6.5. Correlations between the classifications

The correlations between the previously mentioned classifications are summarized in below table. The HS codes describe the products in the most detail. The UNU-KEYS are constructed from the HS codes, and this link is displayed in Annex 1. The UNU-KEYS, in turn, can be related to the 6 or 10 categories in the WEEE Directives, as indicated in the next Table.

The Basel Codes and LoW codes, however, are difficult to relate to the HS codes. This mainly is due to the fact that the HS nomenclature defines waste as the residual streams. This is in conflict with the definition of waste in Article 1 of the Basel convention, which states that wastes are substances or objects that are disposed of or are intended to be disposed of, or are required to be disposed of by the provisions of national law.

	UNU-KEY	HS	EU LIST PF WASTE (LoW)	BASEL CODES	SEEA	EU WEEE DIRECTIVE 6 CATEGORIES
HS	One HS code unique link to the UNU-KEYS					
EU LIST PF WASTE (LoW)	Not directly correlated	Not complete match, due to differing concepts of waste in HS classification and LoW				





BASEL CODES	Not directly correlated	EU has published a correlation table	Not directly correlated			
SEEA	One UNU-KEY can be linked to SEEA	One HS code is linked to SEEA	Not directly correlated	Not directly correlated		
EU WEEE DIRECTIVE 6 CATEGORIES	One UNU-KEY can be correlated to the 6 categories, with the exception of the size distinction	One HS code can be correlated to the 6 categories of the WEEE Directive with the exception of their size distinction	Not directly correlated	Not directly correlated	Not directly correlated	
EU WEEE DIRECTIVE 610 CATEGORIES	One UNU-KEY links to a category in the WEEE Directive	One HS code can be correlated to the 10 categories of the WEEE Directive	Not directly correlated	Not directly correlated	Not directly correlated	Not directly correlated but can be linked with UNU-KEYS

Correlation between various classifications (source: UNU VIEW)

Objects that are “intended to be disposed of” include a larger variety of commodities that the HS would categorize as “products” in Chapters 84 and 85, as opposed to waste, which is their legal status according to the Basel convention. A preliminary correlation table between customs nomenclature codes and waste codes was published by the European Commission in the Commission Implementing Regulation (EU) 2016/1245. The LoW and Basel codes are currently not correlated to each other.



7. ACTORS INVOLVED IN THE SYSTEM

The “all actors” approach to WEEE management includes every stakeholder legally involved in handling electronic waste—covering activities like collection, logistics, preparation for reuse, refurbishment, and treatment—as well as those responsible for oversight and enforcement of related laws. All these actors must comply with the WEEE Directive's requirements around compliance, monitoring, and reporting. Together, they work to ensure responsible management of WEEE and maintain transparent regulatory supervision.

A key element of this approach is the mandatory handover principle, which mandates that WEEE must be managed only by certified collectors and recyclers. If WEEE is initially collected by uncertified parties, it must be handed over to certified operators, sometimes with compensation for this transfer. This system aims to enhance both the quantity of WEEE collected and the accuracy of registration throughout the waste management chain.

List of actors in the model of All-Actors Approach (AAA)	
National competent authorities include:	
• Member State governments	
• National waste authorities	
Enforcement bodies:	
• Inspection and customs	
Coordination body.	
EEE Producers and PROs	
Retail. Including household and non-household WEEE.	
Local authorities.	
Other collection channels (e.g.B2B collection points, installers, demolition companies, social economy, etc).	
Preparing for reuse.	
WEEE treatment companies. Including: WEEE recyclers and licensed (for treating/accepting WEEE) scrap and car shredders.	
Brokers, dealers, traders, other actors involved in legal export of UEEE/WEEE (producers, NGOs, facility managers...)	
Citizens/Business/Public sector-WEEE generators	

7.1. Producers and producer responsibility organizations (PRO)

A Producer Responsibility Organisation (PRO) is a national collective entity that helps producers meet their legal obligations regarding waste management. Funded by its members, producers join a PRO by paying fees based on the type, quantity, and characteristics of the products they put on the market. Once enrolled, the PRO assumes the legal responsibility for meeting regulatory targets and compliance on behalf of these producers.

In Europe, the Extended Producer Responsibility (EPR) system for Waste Electrical and Electronic Equipment (WEEE) is governed by the EU WEEE Directive. This directive requires producers to finance the collection, transport, and environmentally sound treatment of WEEE, either individually or through collective schemes. Many European countries also

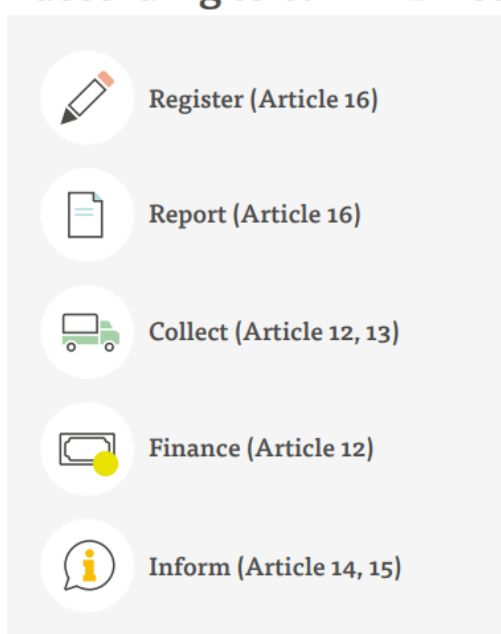


mandate that producers register with a national WEEE management organization to oversee these processes.

Producers are encouraged to design products that are easier to recycle and contain fewer hazardous substances, improving material recovery and reducing environmental impact. They must meet collection and recycling targets set by member states and regularly report on their WEEE management activities, including data on quantities collected, processed, and related costs. Producers are also responsible for informing consumers about proper WEEE disposal, including available collection points and return procedures.

Overall, the EPR system holds producers accountable throughout their products' lifecycle—from manufacture to disposal—by requiring them to cover WEEE management costs and promote eco-friendly design. This framework supports sustainable waste management and advances the transition toward a circular economy.

Producer responsibilities according to WEEE Directive



7.2. Extended Producer Responsibility (EPR)

Extended Producer Responsibility (EPR) is a key policy mechanism for managing Waste Electrical and Electronic Equipment (WEEE) in Europe. Established through the EU WEEE Directive, EPR assigns producers full responsibility for the entire lifecycle of their electronic products, including financing their collection, transportation, and environmentally sound treatment. This approach has been successful in promoting sustainable WEEE management by motivating producers to design products that are easier to recycle and by reducing the environmental impact of electronic waste. As a result, many European countries have adopted EPR policies, recognizing producers as essential players in advancing the circular economy and mitigating the environmental risks of WEEE.

The OECD defines EPR as an environmental policy strategy that extends producer responsibility beyond point of sale to include the post-consumer phase of a product's lifecycle. Practically, this means producers must ensure their products are collected at end-of-life and properly sorted before final treatment, preferably



the





recycling. EPR schemes may require producers to provide financial support or to take over operational and organizational roles, sometimes relieving municipalities from these duties (as seen in packaging waste management).

In Europe, two main EPR system types exist for WEEE: individual and collective.

- Individual EPR systems: Here, each producer finances the collection, transport, and treatment of WEEE originating from their own products. Producers either manage these processes themselves or contract service providers, and they are responsible for reporting their WEEE management activities to relevant authorities.
- Collective EPR systems: In this model, multiple producers collaborate within a collective scheme that manages and funds the collection, transport, and treatment of WEEE from all member products. By pooling resources, producers share the costs and administrative burden. The collective scheme handles environmental compliance and reporting obligations on behalf of its members.

Both systems aim to ensure that WEEE is managed responsibly while supporting producers' accountability in the circular economy.

The implementation of WEEE Extended Producer Responsibility (EPR) across Europe varies from country to country, with each nation adopting its own tailored system. The general steps involved in establishing a WEEE EPR system can be outlined as follows:

- Develop legislation: Countries first enact national laws to transpose the EU WEEE Directive into their legal frameworks. This legislation sets out producer obligations, WEEE management requirements, and penalties for non-compliance.
- Choose an EPR system: Each country decides whether to adopt an individual or collective EPR model. This choice depends on factors such as market size, number of producers, and available resources.
- Establish a Producer Responsibility Organization (PRO): For countries opting for a collective EPR system, a PRO is formed to handle the collection, transportation, and treatment of WEEE on behalf of producers.
- Develop collection and recycling infrastructure: Nations must create the necessary infrastructure for WEEE management, including collection points, recycling facilities, and transportation networks.
- Set up monitoring and reporting systems: To ensure compliance, countries establish mechanisms to monitor and report on the collection, transport, and treatment of WEEE, verifying that producers meet their legal obligations.

Examples across Europe illustrate these different approaches: Germany employs a collective EPR system where producers join a PRO responsible for WEEE management; France follows a similar collective model. Italy, in contrast, uses an individual EPR system where each producer manages their own products' collection and recycling. Spain applies a hybrid approach, requiring larger producers to handle their own WEEE, while allowing smaller producers to participate in a collective scheme.

Overall, implementing WEEE EPR in Europe requires a blend of legislative, organizational, and infrastructural efforts. The exact system adopted in each country reflects its unique national context and available resources.





Extended producer responsibility (EPR).

7.3. Retailers

Retailers play a crucial role in the WEEE collection network. It is recommended that Member States consider broadening the current 1x0 obligation—which now applies only to stores with sales areas over 400 m²—to include more retailers, as long as this expansion remains economically and environmentally sustainable.

Beyond legal duties, retailers are encouraged to:

- Actively participate in coordination bodies.
- Collect small WEEE items from both household and non-household retailers, whether in-store or during deliveries.
- Report the WEEE they collect, ideally using tools that simplify administrative tasks.
- Promote reverse logistics practices.
- Financially support central organizations running consumer awareness campaigns.
- Help prevent illegal WEEE flows and improper treatment, especially during delivery take-back.

For instance, in the Netherlands, some retailers offer pick-up services for small appliances, illustrating an expanded retail role.

In a fully developed “all actors” (AAA) system, retailers should have the option to manage and finance the treatment of WEEE collected on-site, if they choose. They would be responsible for reporting these actions, provided they ensure proper treatment or transfer the waste to Producer Responsibility Organizations (PROs), who have the right to free uplift and cover treatment costs.



Retail associations and sector representatives are encouraged to involve their members in awareness campaigns, ideally collaborating with PROs via coordination bodies. It is also proposed that retail groups participate in research and development efforts to promote reverse logistics as a means to improve WEEE collection.

7.4. National competent authorities and Enforcement bodies

In the “all actors approach” (AAA), national competent authorities play a crucial role in establishing a robust legislative framework that ensures every stakeholder involved in WEEE collection contributes according to their responsibilities to meet national collection targets.

Key actions envisioned for national (waste) competent authorities under the AAA include:

- Establishing a coordination body to oversee and facilitate cooperation among all stakeholders.
- Ensuring effective coordination through this body, fostering regular communication and synergy between policymakers and enforcement agencies such as customs and inspection authorities.
- Providing legislative support to boost collection efforts by:
 - Mandating reporting obligations for all actors.
 - Regulating and enforcing comprehensive reporting, including tracking of used electrical and electronic equipment (UEEE) and WEEE imports and exports.
 - Creating legal frameworks that encourage the use of reverse logistics for WEEE collection.
 - Enforcing mandatory handover of WEEE to Producer Responsibility Organizations (PROs).
 - Making CENELEC standards compulsory.
- Participating in monitoring and measurement initiatives for complementary waste flows (e.g., municipal solid waste).
- Supporting targeted national awareness campaigns.
- Offering clear, harmonized guidance on collection and sorting to local authorities.

Enforcement agencies, particularly inspection bodies, are vital to the success of the AAA. Alongside legislative measures and incentives, inspection campaigns help maintain a level playing field by ensuring compliance.

Enforcement bodies should implement national, targeted inspections and enforcement actions focused on:

- Verifying reporting accuracy of WEEE received and UEEE exported/imported by all actors.
- Ensuring proper treatment of WEEE.
- Addressing producer reporting to combat freeriding.

Customs authorities are responsible for overseeing import and export reporting of UEEE and WEEE. A thorough review of current practices is essential to develop an improvement plan aimed at:

- Enabling clear traceability of UEEE and WEEE shipments across borders.
- Ensuring WEEE is treated appropriately outside Europe.



- Enhancing reporting compliance from shipment companies.

Additionally, international multi-stakeholder groups are encouraged to collaborate on managing transboundary movements, improving knowledge sharing, and providing relevant training.

7.5. Coordination body

In an All Actors Approach (AAA), every stakeholder with potential influence on WEEE collection rates should actively contribute toward achieving national collection targets. Ensuring efficient resource use and effective monitoring demands strong coordination and seamless communication among all parties involved. Ideally, a coordination body should include representatives from all actors impacting collection rates. Producer Responsibility Organisations (PROs) must play a central role in this body's governance to guarantee that initiatives are cost-effective, proportionate, and fair.



It is proposed that the coordination body will:

- Oversee and monitor the allocation of collection responsibilities.
- Track compliance with collection obligations and overall progress toward national collection goals.
- Establish and manage a reporting framework and tools, coordinating data submission from all actors.
- Facilitate agreements between PROs and local authorities to enhance the collection of household WEEE.
- Develop strategies to expand and improve the collection network, including optimizing current collection points and incentivizing new collectors to join the system.
- Coordinate with other sectors (e.g., construction, automotive) to support monitoring and traceability efforts.
- Finance research and development activities, such as studies on WEEE flows and best practice technical developments.
- Lead national and local communication campaigns to ensure efficient use of resources and deliver consistent, well-informed messaging.
- Participate in enforcement planning and provide support for enforcement activities.

The coordination body may receive funding from public and/or private sources. Although the body manages responsibilities assigned to producers (e.g., under Articles 14 and 15 of the WEEE Directive) to ensure resource efficiency and consensus, financing for these responsibilities will remain the producers' obligation.

7.6. Local authorities

Local authorities are the cornerstone of the WEEE collection network. Within the AAA framework, municipalities are encouraged to actively promote WEEE collection among residents. Beyond their legal duties, local authorities are recommended to:

- Participate in the coordination body.



- Establish agreements with Producer Responsibility Organisations (PROs) to transfer WEEE received at municipal facilities. If not legally required and municipalities can hand over WEEE to downstream processors, extra controls, traceability based on evidence, and guarantees of proper treatment should be ensured, such as through legislation defining tendering conditions.
- Conduct targeted, harmonized, and clear awareness campaigns.
- Implement measures to prevent theft and scavenging of WEEE.
- Monitor and benchmark collection rates, as well as incidents of scavenging and theft.
- Collaborate with enforcement agencies to address theft and scavenging by reporting incidents, training collection point staff, and applying strategies to reduce such activities.
- Where legally empowered, conduct enforcement campaigns against illegal treatment and misreporting of WEEE.

Actions marked with “should” are preferably supported or facilitated by the coordination body.

7.7. Other collection channels (e.g. B2B collection points, installers, demolition companies, social economy, etc)

The AAA encourages expanding the collection network by including all actors with access to WEEE. This encompasses businesses, installers of equipment like PV panels or air conditioners, demolition and construction companies, social economy organizations, repair services, public institutions, and others.



To ensure their contributions to WEEE collection rates are traceable and follow official channels, it is recommended that these collectors:

- Register as official WEEE collectors when required, adhering to take-back and collection obligations. The registration or authorization process should be straightforward and free of charge to avoid discouraging participation in the collection network.
- Report all received WEEE and its subsequent handling in an official database.
- Guarantee the traceability and proper treatment of collected WEEE at authorized facilities.
- Provide necessary support to combat practices that cause irregular flows or improper treatment of WEEE.

These collection channels are encouraged to establish agreements with national PROs, enabling them to benefit from resources available to ensure proper WEEE management.

7.8. Preparing for reuse organizations

Preparing for reuse organisations are becoming more and more relevant and supported by the WEEE sector. Their role as contributors to the circular economy is undeniable. In certain Member States, they offer an efficient collection network that should be used for collecting WEEE whenever it is possible. Alliances between preparing for reuse organisations and PROs have shown good results in some Member States. PROs and preparing for reuse organisations in other MS are encouraged to learn from successful experiences and try to replicate them. It is important to ensure proper traceability of the WEEE that is handed over to preparing for reuse organisations.



Exploring efficient and safe ways for ensuring access to WEEE to preparation for reuse is also encouraged. In this AAA approach, it is suggested that preparing for reuse organisations:

- Participate in a coordination body.
- Become authorised WEEE collectors.
- Report all received WEEE and its subsequent fate to an official database.
- Establish partnerships with PROs to guarantee accurate reporting and proper management of WEEE.
- Comply with recognized preparation for reuse standards, such as EN50614.
- Provide support to address and prevent irregular flows and improper treatment of WEEE.

Additionally, exploring efficient and safe methods to facilitate access to WEEE for preparation for reuse is strongly encouraged.

7.9. WEEE treatment companies

In many Member States, recyclers often perform multiple roles beyond treatment, including logistics and collection, making them an integral part of the WEEE collection network. By having access to WEEE, they contribute directly to achieving national WEEE collection targets under this AAA. However, some Member States do not authorize companies treating scrap to handle specialist WEEE treatment, despite these companies receiving WEEE mixed with scrap and processing it as scrap. To fully implement this AAA, such companies should either become authorized WEEE treatment facilities or separate WEEE from scrap and forward it to authorized treatment centers.

It is recommended that metal recycling companies:

- Comply with standards that include traceability protocols.
- Report the quantities of WEEE received, the categories involved, activities performed, and the fate of WEEE or resulting fractions, either through agreements with PROs, authorities, or via a national database.
- Ensure that scrap facilities receiving WEEE mixed with scrap under a licence or registered exemption report the WEEE received and treated, or send it to authorised WEEE treatment facilities.
- Provide treatment quality reports to the coordination body.
- Support law enforcement efforts by participating in audits and inspection programs.

Brokers, dealers, traders, and other actors involved in the legal export of UEEE/WEEE (including producers, NGOs, facility managers, etc.)

Certain types of WEEE circulate as valuable commodities. Brokers, dealers, traders, and similar actors play a role in the WEEE value cycle and, as entities with access to WEEE, must contribute to meeting national collection targets according to their capacities and limitations.

It is recommended that these actors:

- Report all WEEE received and its fate to a national database.
- Report all UEEE exported or imported, either through agreements with PROs, authorities, or directly to a national database.





- Provide evidence of proper treatment for WEEE traded.
- Assist efforts to combat irregular flows and improper treatment of WEEE.

7.10. Citizens/Business/Public sector-WEEE generators

Hoarding and improper disposal of WEEE are significant issues in some Member States and occur to varying degrees in all. As the first holders of WEEE, citizens and other WEEE generators play a crucial role in determining disposal routes and are therefore key to ensuring correct disposal and boosting collection rates.

Citizens should be encouraged to:

- Reduce hoarding of WEEE.
- Avoid disposing of WEEE through incorrect channels.



8. STANDARD MONITORING SYSTEMS

The main goal of the policies mentioned is to improve WEEE collection and recycling, with specific targets for each EU Member State. Approaches differ across countries and waste categories, often involving a combination of government efforts, producer responsibility schemes, and private sector involvement.

Standard e-waste monitoring systems provide structured frameworks to track and manage electronic waste throughout its lifecycle. These systems are crucial for regulatory compliance, performance evaluation, and enhancing e-waste management efficiency.

Key components include:

- Tracking and tracing mechanisms: Using barcodes, digital tags, or similar technologies to follow e-waste from collection to recycling, preventing illegal diversion.
- Data management systems: Collecting detailed data on types and quantities of e-waste collected, processed, recycled, or disposed of, ensuring accuracy and transparency.
- Compliance monitoring: Ensuring all parties meet legal requirements, recycling targets, and environmental standards.
- Performance assessment: Measuring recycling rates, resource recovery efficiency, and reductions in hazardous substances.
- Reporting and transparency: Making information accessible to regulators, stakeholders, and the public about e-waste management and environmental impacts.
- Auditing and verification: Confirming that e-waste is handled according to protocols and best practices, supporting accountability.

These systems also facilitate continuous improvement by identifying gaps and optimizing strategies. They often integrate with broader policy tools like Extended Producer Responsibility (EPR) programs to ensure alignment with legal obligations.

In summary, effective monitoring systems are essential for oversight, governance, and driving sustainable e-waste management across all involved stakeholders.



8.1. POM

The POM method calculates the WEEE collection rate by dividing the mass of WEEE collected by the average amount of Electrical and Electronic Equipment (EEE) placed on the market (POM) over the previous three years. From 2013 to 2016, collection rates rose from 39% to 50%, but then declined to 44% by 2020. This drop occurred despite increased WEEE collection because the volume of EEE placed on the market grew even more rapidly, lowering the collection rate when measured this way.

The POM method provides a long-term view of collection trends and is less influenced by short-term changes in WEEE generation or collection. However, its accuracy depends on the reliability of POM data and shifts in the types of products introduced to the market.

Governments typically gather POM data through reports from producers and importers, who are required under the WEEE Directive to declare the quantities of EEE they place on

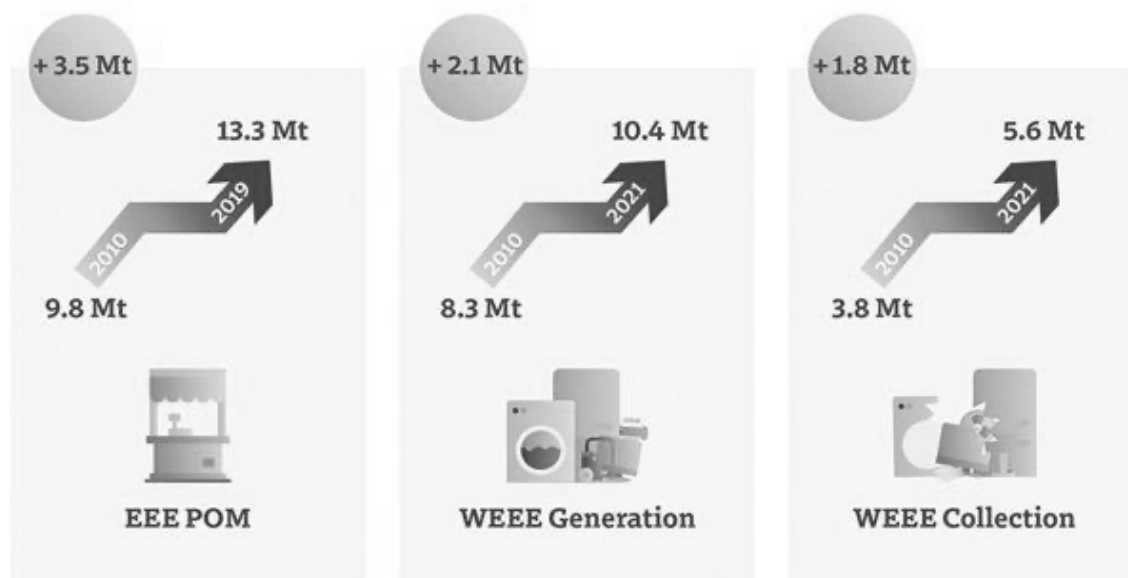


national markets. Authorities then use this data to check compliance with collection targets for various WEEE categories.

Initially, the collection rate was calculated by dividing collected WEEE by the average EEE POM over the prior three years, starting in 2016. The initial target was 45% for 2016, rising to 65% by 2019, reflecting increasingly ambitious recycling goals.

Overall, regulations ensure that manufacturers, distributors, and consumers share responsibility throughout the product lifecycle—from market introduction to disposal—promoting environmentally responsible management of electronic waste.

The



amount of EEE POM (Source: <https://www.scycle.info/new-study-update-of-weee-collection-rates-targets-flows-and-hoarding/>)

8.2. Life time

The lifetime of Electrical and Electronic Equipment (EEE) refers to the expected period during which the equipment functions properly and efficiently before it reaches the end of its usable life. These lifetimes vary by product type and country. For example, in the EU, lifetime profiles for different EEE types are often modelled using Weibull functions, which capture how equipment ages over time.

There is generally no official government data on EEE lifetimes, though some countries may have scientific or locally conducted studies providing insights. A sensitivity analysis across various EU countries found that lifetime variability can introduce about a 10% margin of error in estimating e-waste generation for each country. Because of this, it's recommended that countries empirically determine EEE lifetimes tailored to their specific context.

Despite some differences, variations in product lifetimes across EU countries are relatively small for most categories. Accurately defining these lifetimes is important for setting realistic expectations on how long equipment will remain functional, which in turn impacts sustainability efforts and responsible consumption. Since lifetime directly affects the amount of e-waste generated, understanding and managing it helps reduce the environmental footprint of electronic products.



8.3. System of Environmental-Economic Accounting (SEEA)

The System of Environmental-Economic Accounting (SEEA) sets internationally recognized standards for defining, classifying, and reporting environmental and economic data in a consistent way. It aligns closely with the System of National Accounts (SNA), ensuring that environmental statistics, like those on e-waste, integrate smoothly with broader economic data.

Within SEEA, e-waste is covered under Waste Accounting (Chapter 3.6.5) as a subset of the waste generated from electrical and electronic equipment (EEE) and vehicles. However, current guidelines don't specify the origin of the waste (e.g., industrial sectors such as ISIC/NACE 18 or households), which is important for accurate SEEA reporting. To address this, additional modelling approaches—such as using the UNU-KEY classification system—may be needed to better attribute waste sources.

SEEA also includes data on the import and export of e-waste, although tracking these transboundary flows remains difficult due to their complexity.

Additionally, SEEA recognizes secondary materials recovered from e-waste, like plastics, scrap metals, and residues. While these materials are not included in direct e-waste statistics, they can be incorporated into wider analyses to better understand resource flows and material recovery across the economy.

8.4. Framework for the Development of Environment Statistics (FDES)

The Framework for the Development of Environment Statistics (FDES) is a versatile and comprehensive conceptual and statistical framework designed to be both integrative and adaptable. It defines the scope of environmental statistics and provides a structured approach for collecting, compiling, and synthesizing data from various sources and subject areas. This framework supports the analysis of environmental issues critical for policy formulation and decision-making.



Within FDES, Subcomponent 3.3: Generation and Management of Waste covers statistics on the quantity and characteristics of waste, including e-waste. Waste is defined as discarded material no longer needed by its owner or user, arising from production and consumption activities. The FDES provides a systematic framework for identifying and collecting waste statistics, including e-waste data. Furthermore, it aligns waste statistics with the International Standard Industrial Classification (ISIC) to ensure better integration with economic statistics.



8.5. Stock (S)

The stock (S) represents the total amount of electrical and electronic equipment (EEE) owned by households, businesses, and the public sector. However, there is generally a lack of comprehensive and harmonized data covering all 54 UNU-KEY categories, especially for household and business appliances.

Some countries gather stock data for specific products through household surveys carried out by national statistical institutes. These surveys typically measure ownership or penetration rates of various EEE, providing valuable input for the overall measurement framework.

This methodology involves counting both functional and non-functional appliances. Another, less precise, approach uses the number of service subscriptions as a proxy—assuming each subscription corresponds to at least one appliance. However, this can be inaccurate since some appliances may have multiple subscriptions while others have none.

Some countries also use ICT penetration rates to estimate minimum stock levels, but these surveys often miss households that own multiple devices, leading to potential underestimations.

8.6. Formal collection of e-waste (W_{formal})

Data on the formal collection of e-waste is not typically modelled and must be gathered by each country using methods best suited to their situation. When we talk about “formal collected e-waste,” we mean the amounts of e-waste that have been collected and recycled according to specific national e-waste management laws, ensuring that recycling meets environmental standards. Ideally, these laws regulate the entire system—from setting collection and recycling targets to defining minimum requirements or certifications for proper recycling practices.

The formal e-waste management system involves multiple actors, all of whom can be sources of data. For example, when e-waste is collected through official take-back systems, it is often assumed that the collected e-waste is also recycled, though there can be some losses during treatment. Data on formally collected and recycled e-waste can be obtained by tracing the waste from its generation to treatment, verifying that it is recycled in certified facilities either domestically or abroad. If data is collected based on treatment facility records, imported e-waste must be subtracted to avoid counting it twice.

In many countries, data collection is supported by legal frameworks, such as licensing and monitoring requirements for recycling operators. These legal provisions allow authorities to maintain registers that serve as a key source for official e-waste statistics. This is particularly true in countries that have adopted Extended Producer Responsibility (EPR) schemes, where producers and designated organizations must gather data on e-waste collected from retailers, municipal points, or pick-up services and ensure it is sent to certified treatment facilities. Even in countries without formal EPR schemes or official registers, e-waste can still be recycled properly if it is handled by certified treatment plants.

Several types of data sources can be used to gather information on formal e-waste collection. Household surveys are one approach, where a representative sample of households is asked about discarded electrical and electronic equipment, how long it was used, and how it was disposed of. Although these surveys often report quantities in units rather than weight, this data can be converted to weight estimates. Another important source is collection points—either municipal or private—where e-waste may be dropped off or collected during bulky waste pick-ups. Increasingly, stores are also becoming collection points, though it is critical that the e-waste gathered there is sent to certified recyclers.

Additionally, treatment facilities themselves are a vital source of data. Registers of e-waste entering certified treatment plants help track the volumes processed. However, some



challenges exist, such as differences between the original waste and what actually arrives for treatment after dismantling, as well as distinguishing domestic waste from imports and exports. To accurately report domestically generated e-waste, imported waste must be subtracted.



Possible flows to trace and potential data sources to gather data on formal collection

Other data may come from waste companies' registers, NGO reports, environmental surveys, or scientific studies. Many industry and public associations compile their own statistics to monitor e-waste streams, and these can be valuable if they meet national quality standards. Moreover, ongoing research contributes to a growing body of knowledge that can support official data collection efforts.

9. THE AREA UNDER ANALYSIS

9.1. General Framework

The primary regulatory reference for waste management at the national level is Legislative Decree 152/2006 (known as the Environmental Code). Legislative Decree 152/2006 adopts the priority criteria from the EU regulatory framework for proper waste management:

1. Prevention
2. Preparation for reuse
3. Recycling
4. Other types of recovery (e.g., energy recovery)
5. Disposal

Legislative Decree 152/2006 regulates the competencies of the State, Region, Province, and Municipality, reserving particularly significant competencies for the Regions (Article 196): the preparation and updating of the Regional Waste Management Plan, the approval of projects for new waste management plants, including hazardous waste, the authorization to operate waste disposal and recovery operations, the delimitation of Optimal Territorial Areas (ATO), and the definition of criteria for identifying unsuitable areas for the location of disposal and recovery plants and suitable disposal sites.

On September 3, 2020, Legislative Decrees No. 116, 118, 119, and 121 were issued, transposing the EU Directives on the "Circular Economy Package":

- Legislative Decree 116: transposed Directives 2018/851/EU and 2018/852/EU on waste and packaging waste, amending Legislative Decree 152/2006;
- Legislative Decree 118: transposed Directive 2018/849/EU on waste batteries and accumulators and waste electrical and electronic equipment (WEEE), amending Legislative Decrees 188/2008 and 49/2014;
- Legislative Decree 119: transposed Directive 2018/849/EU on end-of-life vehicles, amending Legislative Decree 209/2003;
- Legislative Decree 121: transposed Directive 2018/850/EU on landfill waste, amending Legislative Decree 36/2003.

Legislative Decree 116, in particular, introduced (with the new Article 198-bis) the "National Waste Management Program" (PNGR), approved by the Ministry of the Environment (with the support of ISPRA) with Ministerial Decree



No. 257 of 24/06/2022. The PNGR is valid until 2028 and constitutes the strategic guidance tool for the Regions in waste management planning, setting macro-objectives and defining the criteria and strategic lines that the Regions must follow in the development of Regional Waste Management Plans. The PNGR aims to ensure both the compliance of planning criteria with the objectives of EU legislation and the sustainability, effectiveness, and cost-efficiency of waste management systems throughout the national territory. The reference point for the entire waste management process remains the Regional Waste Management Plan (Article 199): it is up to the Regional Plan to assess the need for new collection systems, the closure of existing plants, the provision of additional infrastructure for plants, etc. Optimal Territorial Areas (ATO) are established (Article 200) to overcome fragmented management through integrated waste management. In compliance with the Regional Plan, each ATO develops a programmatic document, the Area Plan. In the Area Plan, the authority defines the strategies for implementing the Regional Plan at the local level (territorial area). The drafting of the Area Plan takes place after a careful assessment of the current state, needs, and critical issues of the territory, defining strategies to overcome them.

Waste Prevention Policies and Tools Waste prevention is the priority path and the first action tool, finding its main application tool in the National Waste Prevention Program (PNPR), adopted by the Ministry of the Environment with Ministerial Decree of October 7, 2013. The National Waste Prevention Program was drafted following the issuance of Directive 2008/98/EC by the EU. Waste prevention not only concerns waste management but also involves the previous stages of production and consumption. The main objective of the PNPR is to reduce the environmental impacts due to waste production. The indicator used in the Program is the ratio between waste production and GDP (Gross Domestic Product), as a decrease in waste could be due to economic factors and not necessarily to an improvement in the waste management system. The PNPR outlines general measures aimed at contributing to the overall success of prevention policies.

The measures cover the following themes:

1. Sustainable production
2. Green Public Procurement
3. Reuse
4. Information, awareness, and education
5. Economic, fiscal, and regulatory tools
6. Research





The PNPR also pays particular attention to specific waste/product streams considered of priority importance:

- Biodegradable waste
- Paper waste
- Packaging waste
- WEEE
- Construction and demolition waste

For each of these categories, specific measures are proposed.

9.1.1. Separate Collection, Preparation for Reuse, Recycling, and Waste Recovery

With the new Article 181, preparation for reuse is definitively placed alongside recycling and waste recovery as activities that must be promoted by Entities, encouraging the development of networks of operators to facilitate preparation for reuse and repair operations, making it easier for them to access suitable waste. To move towards a circular economy with a high level of efficiency, authorities are required to adopt the necessary measures to achieve the following objectives (in compliance with the new preparation for reuse and recycling targets set by Directive 2018/851/EU):

- By 2025, the preparation for reuse and recycling of municipal waste will be increased to at least 55% by weight.
- By 2030, the preparation for reuse and recycling of municipal waste will be increased to at least 60% by weight.
- By 2035, the preparation for reuse and recycling of municipal waste will be increased to at least 65% by weight. It is important to note that these targets refer to preparation for reuse and recycling, not to separate collection (the separate collection targets are identified in Article 205 of the decree). Decree No. 119 of 10/07/2023 "Regulation determining the conditions for the exercise of preparation for reuse in a simplified form, pursuant to Article 214-ter of Legislative Decree No. 152 of 3 April 2006" sets out the new provisions for the exercise of preparation for reuse in a simplified form. The provision, among other indications, defines the methods and requirements for entities intending to carry out preparation for reuse activities in a simplified form, the technical and structural equipment required for preparation for reuse centers, the waste excluded from the simplified regime, the maximum quantities of waste that can be used, the origin, types, and





characteristics of the waste that can be used, and the specific conditions for carrying out preparation for reuse operations.

Waste Electrical and Electronic Equipment (WEEE) The main reference for the national regulatory framework on waste electrical and electronic equipment is Legislative Decree No. 49 of 14/03/2014, which transposes the European Directive 2012/19/EU on WEEE, which came into force on 13/08/2012 (replacing previous directives and based on the "polluter pays" principle). Legislative Decree No. 49/2014 has also been recently amended following the transposition of the "circular economy package" (see above, the aforementioned Legislative Decree No. 118 of 3/09/2020). Legislative Decree No. 49/2014 regulates the management and proper treatment of WEEE and identifies the collection target that European countries must aim for from 2019: 65% of the average weight of EEE placed on the market in the previous three years. Legislative Decree No. 49/2014 also establishes the roles and obligations of municipalities and producers to facilitate the principle of extended producer responsibility and achieve the recovery targets defined in Article 19, Annex V, and in accordance with the European directive. The following requirements are highlighted from 15 August 2018 at the national average level:

- For WEEE falling into categories 1 or 4 of Annex III, 85% recovery and 80% preparation for reuse and recycling; • For WEEE falling into category 2 of Annex III, 80% recovery and 70% preparation for reuse and recycling; • For WEEE falling into categories 5 or 6 of Annex III, 75% recovery and 55% preparation for reuse and recycling;
- For WEEE falling into category 3 of Annex III, 80% recycling. Producers, to achieve these minimum targets, send the collected WEEE for proper treatment and recovery, prioritizing preparation for reuse. The obligation for separate collection of WEEE was established following the amendment to Article 205 and the introduction of paragraph 6quater of Legislative Decree No. 152/2006. The intervention of ARERA (Regulatory Authority for Energy, Networks, and Environment) in Annex A to Resolution 15/2022/R/RIF mandates free home collection of bulky waste, allowing the Competent Territorial Entity to extend the application of the provisions contained in the article to other fractions of municipal waste that, due to their nature or size, are not compatible with the collection methods ordinarily adopted in management (such as large WEEE). The simplification decree 65/2010, known as "one-for-one," imposed (as indicated in Legislative Decree 151/2005, Article 6, paragraph 1, letter b) the obligation for all EEE retailers to equip themselves to allow their customers to deliver these wastes free of charge when purchasing a new product and to transport the collected household WEEE to collection centers. Decree 121/2016, known as "onefor-zero," provides that consumers can return small broken appliances to commercial



establishments with a surface area of over 400 square meters without the obligation to purchase a new product. For smaller stores, the provisions of DM 65/2010 and Legislative Decree No. 49/2014 remain in force. Decree No. 40 of 20/02/2023 regulates the updating of the groupings of waste electrical and electronic equipment indicated in Annex 1 of Decree No. 185 of 25/09/2007. Decree No. 59 of 04/04/2023 regulates the waste traceability system and the national electronic register for waste traceability pursuant to Article 188-bis of Legislative Decree No. 152/2006. Decree No. 119 of 10/07/2023 determines the conditions for the exercise of preparation for reuse in a simplified form, pursuant to Article 214-ter of Legislative Decree No. 152/2006. The Decree also contains specific provisions for WEEE, opening new perspectives for a recovery method essential for the transition to a circular economy model. Law No. 115 of 08/08/2024 introduced urgent provisions on critical raw materials of strategic interest. The text aims to align the national legal framework with the provisions of EU

- Regulation 2024/1252 of the European Parliament and the Council of 11 April 2024, establishing a framework to ensure a secure and sustainable supply of critical raw materials. Law No. 166 of 14/11/2024 introduced urgent provisions to promote the recovery of critical raw materials from waste electrical and electronic equipment (Infringement Procedures No. 2024/2142 and 2024/2097). The new Law integrates and amends Legislative Decree No. 49/2014 in Articles 10 and 11 and Legislative Decree No. 152/2006.

In particular, the amendments concern:

- The obligation for Collective Systems to provide, also through the WEEE Coordination Center (CDRAEE), to design, implement, and finance communication, information, and awareness programs for citizens on the importance of separate collection of WEEE and the environmental and economic benefits of their recycling, using at least 3% of the total revenues of the previous year and sending appropriate cost reporting to Mase;
- Simplifications in the collection of WEEE according to the one-for-one and one-for-zero methods by distributors, with reference to the documentation required for the collection of electronic waste and the removal of the obligation to register with the National Register of Environmental Managers.
- Provisions on extended producer responsibility in the e-commerce sector.

9.1.2. Legal Framework in Marche Region

Regional Law No. 15 of 1997 and subsequent amendments regulates the special tax for landfill disposal of solid waste and fits into a continuously evolving regulatory framework in





terms of waste management (the tax was introduced by Law 549/1995 to encourage waste reduction). This tax is modulated based on the results of separate collection and provides for a tax reduction mechanism in case of exceeding the separate collection targets set by sector regulations. Conversely, an additional tax is applied if the minimum targets are not met. Regional Law No. 24 of 01/10/2009 is the reference law at the regional level that regulates integrated waste management and the remediation of contaminated sites. Article 1 lists the purposes of the law in detail. In particular, it highlights:

- Preventing waste production and reducing its hazardousness
- Enhancing and facilitating the separate collection of municipal solid waste, preferably adopting the door-to-door collection system and special waste
- Promoting the development and application of new low environmental impact plant technologies that allow for natural resource savings;
- Reducing waste movement through disposal in appropriate and nearby plants to the place of production;
- Promoting the reduction of undifferentiated waste disposal;
- Promoting information and citizen participation through adequate communication forms;
- Encouraging companies to design products and packaging that reduce the creation of non-recyclable waste at the source, intervening through appropriate economic and/or fiscal incentives. The tools and methods to achieve these objectives are specified in the Regional Waste Management Plan (PRGR). Article 5 details what the PRGR must contain. For matters not explicitly regulated, Regional Law No. 24/2009 refers to the provisions contained in Legislative Decree No. 152/2006 and the current national and EU legislation (e.g., separate collection targets aimed at recycling). With Regional Law No. 18 of 25/10/2011, the functions in integrated waste management were assigned to the Territorial Area Assemblies (ATA), in which municipalities and the province within each Optimal Territorial Area (ATO) must participate. The more recent Regional Law No. 15 of 28/04/2017 grants the ATAs the possibility of entering into agreements for supra-area waste management to achieve greater functionality and efficiency of the regional waste management system. Regional Law No. 41 of 2013 established the "Waste-Free



9.2. Waste Management Plan(s)

As already highlighted, the reference point for the entire waste management process at the regional level is the Regional Waste Management Plan. In October 2024, the regional council adopted the update to the Waste Management Plan of the Marche Region. The currently effective plan was approved by the regional council in 2015, and it has therefore become necessary to proceed with the adjustment to the new regulatory references that establish much stricter objectives. The administrative procedure for the definitive adoption of the new Regional Waste Management Plan is therefore currently underway. The same Regional Waste Management Plan, currently being adopted, identifies the following objectives for the management of WEEE, as detailed in the current legislative framework:

- Prevent the production of waste from electrical and electronic equipment
- Ensure the implementation of an effective separate collection system
- Ensure that the financing of WEEE treatment, recovery, and disposal systems is essentially borne by the producers of the equipment;
- Promote the production of new equipment that facilitates reuse, as well as the recovery and disposal of end-of-life waste.

9.2.1. Rates and figures related to the country and region

In Marche Region

WEEE – Situation in Marche Region

The official framework for WEEE collection in the Marche Region is provided by the annual report prepared by the WEEE Coordination Center (CdC RAEE). The CdC RAEE is a private consortium established in accordance with Regulation No. 185 of 25/09/2007. It is composed of 15 Collective Systems of producers of electrical and electronic equipment (EEE) from households, who are legally required to join, and one Collective System of professional EEE producers. It performs roles and tasks defined in Articles 33 and 34 of Legislative Decree No. 49 of 14 March 2014, and operates under the supervision of the Ministry of the Environment and Energy Security and the Ministry of Enterprises and Made in Italy. The report presents the official and complete data on electronic waste collection carried out in the region: total volumes, per capita values, trends of the groupings, and quantities sent for recycling by individual provinces are among the main results available. The CdC RAEE report for the year 2023 quantifies the total regional collection for the year 2023 at 9,071 tons equivalent to 6.09 kg per capita and for the year 2024 at 9,254 tons equivalent to 5,03 pro capita. The Marche Region is therefore one of the six Italian regions that recorded a positive collection trend in 2023 (+3.1%), compared to a negative national average variation (-3.71%). The largest increases were recorded in the provinces of Fermo (+12.4%) and Macerata (+11.6%), while in Ascoli Piceno, Pesaro, and Ancona the trend remained essentially stable. In the Marche Region, 84.7% of the collection is carried out at collection centers, and 15.3% at distribution grouping points. According to the document of the Regional Waste Management Plan currently being adopted, the Marche Region today has an overabundant plant coverage: in



fact, compared to the quantitative data of WEEE produced in the Region (9,254 tons), 29,728 tons of WEEE are treated in plants (according to declarations by regional entities).

9.2.2. Regional status: Improvements and challenges

According to the Regional Waste Management Plan, as per Legislative Decree 152/2006, WEEE management must prioritize reuse, recycling, and energy recovery, in that order. Based on indicators analysed in 2024, the Marche Region achieved a waste recovery level close to 100%.

However, a critical issue emerges when comparing the quantity of WEEE produced in the Region (9,254 tons) with the amount declared as treated by regional entities (29,728 tons): there appears to be an overabundant plant capacity. Despite this discrepancy, the hierarchy of proper waste management is still observed.

Today, for many electrical and electronic equipment (EEE), the issue of "**planned obsolescence**" is a significant concern. The fight against obsolescence is fundamentally framed within one of the objectives of the **2030 Agenda**. The 2030 Agenda for Sustainable Development is an action program for people, the planet, and prosperity, and it is articulated through the achievement of a series of specific objectives. You can find more information on Waste Electrical and Electronic Equipment (WEEE) at https://environment.ec.europa.eu/topics/waste-and-recycling/waste-electrical-and-electronic-equipment-weee_en.

Below are the actions the Marche Region intends to implement as per Attachment 3 of the Regional Waste Management Program (PRGR) prevention program:

- Awareness campaign and promotion of repair/restoration centers for electrical and electronic equipment to extend the lifespan of goods and combat planned obsolescence.

Stakeholders involved in the action: Public Administration, service companies, businesses.

- Promotion of a reuse network for discarded but still functional electrical and electronic equipment (e.g., computers) (supplier-benefactor).

Stakeholders involved in the action: Public Administration, non-profit organizations (ONLUS), companies.

- Promotion of awareness, information, and education events specifically aimed at combating planned and perceived obsolescence.

Stakeholders involved in the action: Public Administration, educational institutions.

- Promotion and support for technical schools focused on training new specialized repair operators to extend the lifespan of goods by countering obsolescence.

Stakeholders involved in the action: Public Administration, educational institutions.

- Promotion of pilot projects aimed at developing techniques/technologies for the reuse of electrical and electronic equipment.

Stakeholders involved in the action: Public Administration, educational institutions, businesses.



All these actions aim to extend the lifespan of goods, making them as long-lasting as possible, in clear contrast to all forms of obsolescence.

As no critical issues have been found regarding adherence to the waste hierarchy, a series of actions that can still be implemented are listed below:

- Communication actions to ensure correct information to citizens regarding collection, the delivery of WEEE, and the need to separate lithium batteries from them;
- Promotion of agreements with large retail companies and specialized stores to regulate delivery methods not necessarily linked to new purchases;
- Promotion of the "mobile collection" service in the area, supplementary to municipal centers;
- Increase in the number of Reuse Centers and their networking to intercept still functioning EEE before they become waste.

9.2.3. Collection network in Marche Region

In the Marche Region, 83.7% of WEEE collection occurs at municipal Collection Centers (CdR), while 16.1% takes place at retail aggregation points (LdR). This distribution, however, is not uniform across all provinces. For instance, in Fermo, Macerata, and Pesaro Urbino, citizens predominantly bring their electronic waste to CdRs, indicating a strong reliance on these centralized facilities. Conversely, Ancona and Ascoli Piceno exhibit a different trend, with citizens delivering a significant portion of their WEEE (30.3% and 31% respectively) directly to electronics stores.

The primary methods for regional WEEE collection include direct delivery to these municipal Collection Centers (CdR) and, in some cases, an on-call doorstep collection service provided by the Waste Collection Service Operator. While doorstep collection is definitively active for large WEEE, the collection of small household appliances may be limited to civic amenity sites or electronics stores. This is largely influenced by the "1-for-0" law (DM 121/2016), which has been in effect since 2016. This regulation mandates that retailers with a sales area of at least 400 sqm are obliged to take back WEEE smaller than 25 cm from consumers free of charge, irrespective of whether a new item is purchased. This legal framework significantly contributes to the role of retail outlets as collection points, especially for smaller electronic waste.

9.2.4. Collection and processing of WEEE in Marche Region

The overall process for WEEE collection and subsequent processing in the Marche Region is orchestrated by the National WEEE Coordination Center (CDC RAEE). This central entity leverages collective schemes, each specializing in one of the five distinct categories of WEEE. When municipal Collection Centers (CdR) or retail aggregation points (such as electronics and appliance stores) accumulate sufficient quantities of one or more WEEE categories and require pickup, they interface with the CDC RAEE through a dedicated digital platform to submit their collection requests.



Upon receiving these requests, the CDC RAEE efficiently dispatches them to the relevant collective schemes. It's important to note that these collective schemes vary by territory, with each area having its designated operators. Once a request is assigned, the collective scheme takes action by arranging for transporters to pick up the collected WEEE and directing them to the nearest and most appropriate authorized treatment plants. This streamlined system ensures that WEEE, once collected from various points across the Marche Region, is channeled effectively towards specialized facilities for proper processing, aligning with the principles of reuse, recycling, and energy recovery.

9.3. ACTORS INVOLVED IN THE POLICY INSTRUMENT

9.3.1. Main actors in the policy

The policy framework for Waste Electrical and Electronic Equipment (WEEE) management in the Marche Region is primarily guided by the Regional Waste Management Plan, established in accordance with Legislative Decree 152/2006. This foundational legislation sets out the priority hierarchy for WEEE handling: reuse, followed by recycling, and finally, energy recovery. Within this regulatory environment, several key actors play distinct and interconnected roles in ensuring effective WEEE collection and processing.

At the most fundamental level, **citizens and consumers** are the initial generators of WEEE and the primary actors responsible for its proper disposal. Their engagement in the collection process varies across the region, with significant differences observed between provinces regarding their preferred drop-off points. The **Waste Collection Service Operator** is another crucial actor, providing essential services such as on-call doorstep collection for large WEEE and managing the municipal **Collection Centers (CdR)**. These CdRs represent the backbone of the regional collection infrastructure, handling a substantial 83.7% of all WEEE collected.

Retailers, including electronics and appliance stores, also serve as aggregation points (LdR), accounting for 16.1% of regional WEEE collection. Their role was significantly enhanced by the "1-for-0" law (DM 121/2016), in effect since 2016. This regulation mandates that retailers with sales areas of at least 400 sqm must take back WEEE smaller than 25 cm from consumers free of charge, regardless of whether a new purchase is made. This legal obligation firmly establishes them as key players in the collection network, especially for smaller electronic waste items.

Overseeing and coordinating the entire system is **the National WEEE Coordination Center** (CDC RAEE). The CdC RAEE is participated in by 15 Collective Systems of producers of electrical and electronic equipment intended for domestic households, who have a regulatory obligation to join, and by one Collective System of professional EEE producers.

This central body acts as the crucial interface between collection points and the subsequent processing stages. The CDC RAEE operates through a digital platform where municipal CdRs and retail LdRs submit their WEEE collection requests. Upon receiving these requests, the CDC RAEE dispatches them to specialized collective schemes. These schemes, which are differentiated by WEEE category and vary across territories, are responsible for coordinating directly with transporters to pick up the collected WEEE and direct it to the nearest authorized treatment plants. This intricate network of actors ensures a structured and regulated approach to WEEE management in the Marche Region.





The CdC RAE is participated in by 15 Collective Systems

9.4. THE WEEE INDUSTRIAL AND ENVIRONMENTAL IMPACT ON THE POLICY AREA

9.4.1. The WEEE environmental impact on the policy area

The effective management of WEEE is paramount for mitigating environmental harm, as these waste streams often contain hazardous substances and valuable finite resources. The policy instruments in place, particularly those enshrined in Legislative Decree 152/2006 and the Marche Region's Waste Management Plan, are specifically designed to minimize negative environmental impacts through a clear hierarchy of waste management. Prioritizing reuse and recycling significantly reduces the demand for virgin raw materials, conserves natural resources, and lessens the environmental footprint associated with manufacturing new products.

The Marche Region has demonstrated a notable success in this regard, with waste recovery levels reaching nearly 100% in 2024. This high recovery rate indicates that the policy is effectively channeling collected WEEE into processes that prevent it from being indiscriminately disposed of, thereby reducing potential pollution and resource depletion. Although the data reveals an overabundant plant capacity when comparing regional WEEE production to declared treatment volumes, the strict adherence to the waste management hierarchy remains consistent. This suggests that the environmental objectives of proper waste handling are being met, with collected WEEE undergoing appropriate recovery processes rather than harmful disposal. While no explicit "critical issues" in environmental compliance were noted, the existing framework allows for continuous evaluation and the implementation of further actions to enhance environmental outcomes.

9.4.2. The WEEE industrial sector on the policy area

The management of WEEE in the Marche Region constitutes a significant industrial sector, encompassing a complex chain of activities from collection to final treatment. This sector involves a diverse array of industrial and service providers, all operating within the established policy framework. The regional collection infrastructure is a key component, comprising municipal Collection Centers (CdR) and the retail aggregation points (LdR), which function as initial industrial interfaces for waste intake.





A pivotal element of this industrial ecosystem is the National WEEE Coordination Center (CDC RAEE). The CDC RAEE plays a crucial coordination and logistical role, acting as a central hub that receives collection requests via a digital platform and orchestrates the subsequent steps. This digital interface streamlines the industrial process of waste movement. The collective schemes represent specialized industrial entities within this system, each focusing on specific WEEE categories. Their industrial function involves managing the logistics of calling transporters and directing them to authorized treatment plants, which themselves represent a core industrial component responsible for the actual processing and recycling of WEEE.

A notable industrial aspect identified is the "overabundant plant capacity" within the Marche Region. While the region produced approximately 9,254 tons of WEEE in 2024, regional entities reported treating 29,728 tons. This significant discrepancy suggests that the installed industrial capacity for WEEE treatment in the Marche Region is substantially greater than the WEEE generated within its own borders. This could imply that treatment facilities in Marche are also processing WEEE from other regions, or that the industrial infrastructure has been scaled for higher future volumes. While this overcapacity doesn't seem to compromise adherence to the waste management hierarchy, it represents a distinctive characteristic of the regional WEEE industrial landscape, potentially influencing operational efficiencies and investment strategies within the sector.

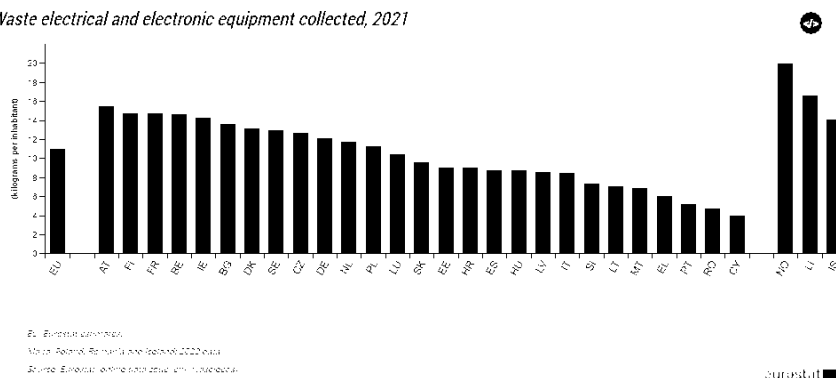


10. THE EEE/WEEE ECONOMIC CONTEXT

Annex V of the WEEE Directive sets the minimum recovery targets that producers must meet, as outlined in Article 11. These targets apply to all WEEE that is separately collected under Article 5 and treated according to Articles 8, 9, and 10. Annex V is divided into three parts, but only the third part has been applicable since August 15, 2018. This section establishes recovery, reuse, and recycling targets for each WEEE category as listed in Annex III of the Directive. For example, for WEEE in categories 1 and 4, the recovery rate must reach 85%, with at least 80% prepared for reuse and recycling. For category 2, the recovery target is 80%, with 70% prepared for reuse and recycling. Categories 5 and 6 have to meet a 75% recovery rate and 55% reuse and recycling rate, while category 3 is subject to an 80% recycling target.

Over the years, the amount of electrical and electronic equipment (EEE) placed on the EU market has increased significantly. In 2012, it was 7.6 million tonnes, rising to a peak of 12.4 million tonnes in 2020, with the lowest point being 7.3 million tonnes in 2013. Overall, there was a growth of more than 60% in EEE placed on the market between 2012 and 2020. In parallel, the volume of WEEE collected rose from 3.0 million tonnes to 4.7 million tonnes, an increase of 58%. WEEE treated increased from 3.1 to 4.6 million tonnes, reflecting a 49% rise. The quantity of recovered WEEE climbed from 2.6 to 4.3 million tonnes, over 65% growth, and the amount prepared for reuse and recycling rose from 2.4 to 3.9 million tonnes, nearly a 62% increase. These figures demonstrate a strong upward trend in the collection, treatment, recovery, and reuse or recycling of WEEE in line with the rise in EEE placed on the market during this period.

Waste electrical and electronic equipment collected, 2021



EU: European Commission
 Values: National Authorities and Eurostat 2022 data
 Source: European Commission and Eurostat

eurostat

WEEE collected in 2021 (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics_-_electrical_and_electronic_equipment)

10.1. EEE/WEEE BUSINESS ENVIRONMENT AND EMPLOYMENT

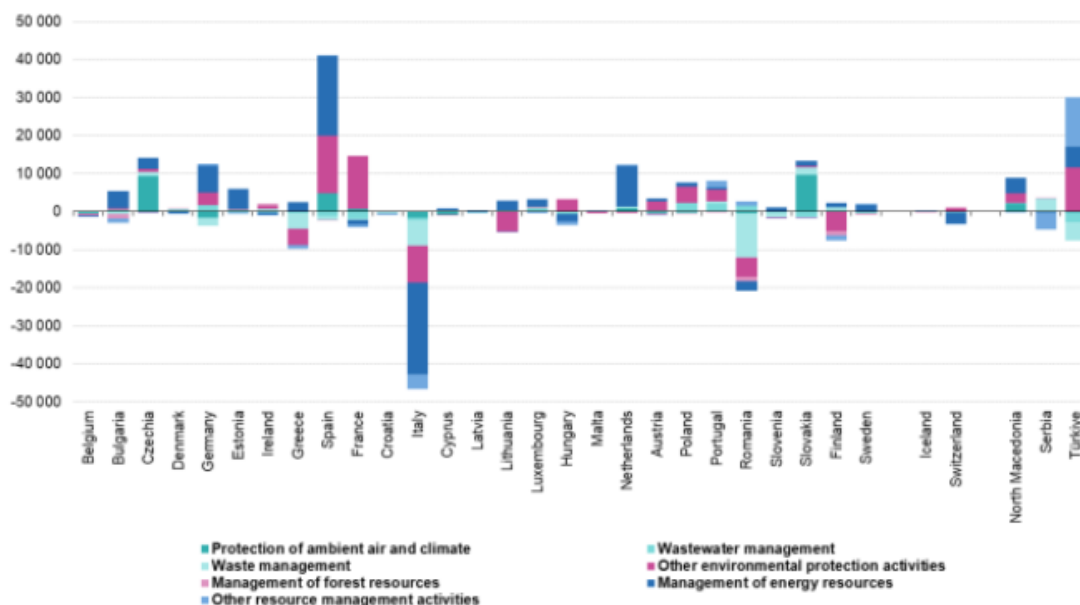
10.1.1. EU

According to the European Environment Agency, employment in the EU's environmental goods and services sector has outpaced overall EU employment growth over the past decade. From 2010 to 2020, the sector's share of total employment increased from 2.1% to 2.5%, with full-time jobs reaching 5.1 million. This expansion has been largely fueled by emerging opportunities in renewable energy, energy efficiency, and waste management. The EU's long-term strategy to reach climate neutrality by 2050 is expected to drive further growth in the green economy and increase the proportion of green jobs in the labor market.



In 2020 alone, environmental goods and services generated employment in 15 EU Member States, with Spain, France, the Czech Republic, the Netherlands, and Slovakia together contributing about 87,000 new jobs. However, 12 Member States experienced a decline in employment in this sector, with Italy losing 46,000 jobs and Romania 18,000. The bulk of green jobs are found in waste and energy resource management.

Job creation in the environmental economy, by country, 2019-2020



Source: Eurostat (online data code: env_ac_egss1)

eurostat

Job creation in the environmental economy in 2019-2020 ([Environmental economy – statistics by Member State - Statistics Explained \(europa.eu\)](#))

10.2. EEE/WEEE EDUCATION, SKILLS AND CAPACITY BUILDING

10.2.1. EU

Awareness and education about e-waste have become increasingly vital in the EU as concerns over the environment, resource preservation, and sustainable practices grow. Various approaches are being used to enhance understanding of e-waste issues.

In many EU countries, environmental education is now integrated into school programs, teaching students about the consequences of improper e-waste disposal, the importance of recycling, and ways to minimize electronic waste.

Governments and NGOs across Europe run awareness campaigns to inform the public about the hazards of e-waste, the advantages of proper disposal, and how to access recycling services, reaching people of all ages.

At the local level, community organizations frequently organize events, workshops, and educational activities focused on responsible e-waste handling, sharing knowledge and practical advice on recycling and reusing electronic devices.





Certain initiatives also emphasize digital literacy and responsible technology use, encouraging people to consider the environmental impact of their electronics and to opt for repair or reuse rather than replacement.

Businesses are increasingly contributing by offering take-back schemes, providing recycling information, and promoting awareness about proper electronic product disposal.

Despite these positive developments, challenges remain. Many individuals still lack knowledge about the environmental dangers of e-waste and how to dispose of it responsibly. In some regions, access to clear information about recycling points and repair services is limited. Additionally, promoting lasting behavioral changes is difficult, as convenience often drives unsustainable disposal habits.

To tackle these challenges, efforts across the EU continue to focus on enhancing education, improving resource accessibility, and fostering a culture of responsible consumption. The ultimate aim is to advance a circular economy where electronic devices are used efficiently, disposed of properly, and their materials recovered for future use.

Erion Weee

The Erion WEEE Academy model can be easily adapted in other EU Member States, especially where education gaps exist in WEEE handling. Source: https://weee-forum.org/ws_members_map/erion-weee/



11. THE STRATEGIC AND POLICY CONTEXT

11.1. EU POLICY CONTEXT

11.1.1. WEEE EU POLICY

The European Union's waste management policy aims to ensure strong environmental protection while addressing the unique challenges faced by different regions within the EU. At its core is Directive 2008/98/EC, which provides the legal basis for waste management across Member States. This directive has been reinforced by updates such as Directive (EU) 2018/851, reflecting the EU's increasing dedication to advancing a circular economy.

The directive's goal is to protect both the environment and human health by encouraging proper waste handling. It promotes recovery and recycling methods that reduce the strain on natural resources and enhance their efficient use. A key principle within the directive is the waste hierarchy, which ranks waste prevention as the highest priority, followed by preparing waste for reuse, recycling, and then other recovery methods such as energy recovery. Additionally, the "polluter pays" principle is established, making waste producers financially responsible for managing their waste—this creates an incentive for more sustainable behaviour among producers and consumers.

The 2018 amendment increased the EU's ambitions by tightening targets for waste reduction and recycling, supporting a shift toward a resource-efficient, sustainable economy where valuable materials remain in use longer.

The directive also includes specific rules for particular waste types, like electronic and electrical waste (WEEE), packaging waste, and hazardous substances in electronics governed by the RoHS Directive. For instance, Directive 2018/852 targets packaging waste, urging Member States to prevent packaging waste and encourage reuse and recycling to boost the circular economy.

Regarding electronic waste, directives such as 2012/19/EU and 2012/65/EU impose extended producer responsibility, requiring producers to ensure WEEE is collected separately and recycled responsibly. This aids resource conservation and environmental protection. Complementing these regulations, the RoHS Directive restricts hazardous substances in electronic products, promoting greener manufacturing and reducing health and environmental risks.

Together, these laws create a robust framework that supports sustainable waste management, enhances resource efficiency, and advances the EU's wider goals of environmental protection and sustainable development.



The Circular Economy Action Plan

The Circular Economy Action Plan underscores the critical role of WEEE, highlighting the valuable raw materials found in electronic devices and calling for both legislative and non-legislative measures to boost their recovery. Central to the EU's goal of climate neutrality by 2050 is the decoupling of economic growth from resource consumption and the shift towards circular models of production and consumption.

In March 2020, the European Commission introduced an updated Circular Economy Action Plan, which the Council supported in December 2020, recognizing the circular economy as essential for a green recovery in the wake of the COVID-19 pandemic. The plan presents more than 30 initiatives aimed at improving product design, promoting circular production



methods, and empowering consumers and public buyers, with a particular focus on sectors such as electronics, batteries, packaging, plastics, textiles, construction, and food.

In 2023, the Council adopted a new position on construction products, seeking to enhance their durability, reparability, recyclability, and ease of remanufacturing.

To support the WEEE Directive's implementation, the European Commission has launched several initiatives, including campaigns to promote compliance and technical research.

Electronics and ICT have been identified as a priority value chain in the second Circular Economy Action Plan. Proposed actions include regulatory updates under the Ecodesign Directive to ensure devices like smartphones, tablets, and laptops are designed with energy efficiency, durability, reparability, upgradability, maintenance, reuse, and recyclability in mind. The plan also champions the 'right to repair,' which encompasses the ability to update outdated software, and seeks to regulate chargers to enhance their durability and allow consumers to buy chargers separately from new devices. Moreover, initiatives are in progress to improve the collection and processing of e-waste, including the potential introduction of an EU-wide take-back system.



Circular Electronics Initiative

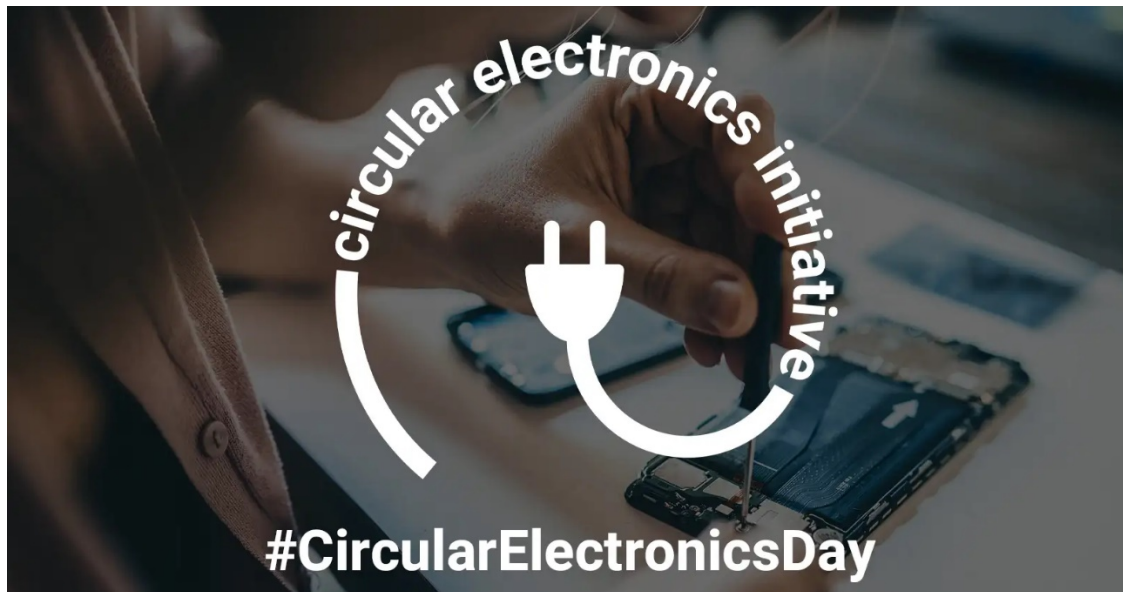
As part of the European Green Deal, the Commission's Circular Electronics Initiative, launched in 2020, aims to extend product lifespans, reinforce the right to repair, introduce common chargers, improve e-waste treatment, and reassess restrictions on hazardous substances. The European Parliament has supported this initiative, advocating for mandatory certification of recyclers and tackling challenges such as planned obsolescence and gaps in recycling infrastructure.

In June 2023, the Commission introduced measures to make mobile phones and tablets more energy-efficient, durable, and easier for consumers to repair, upgrade, reuse, and recycle.

The proposal for a common charger, first introduced in September 2021 and finalized in November 2022 as Directive (EU) 2022/2380, is a key step toward greater standardization and sustainability.

Looking forward, in March 2023, the Commission also proposed a directive to strengthen the 'right to repair,' aiming to further increase product durability and reduce waste generation.





European Green Deal

The European Green Deal is a package of policy initiatives, which aims to set the EU on the path to a green transition, with the ultimate goal of reaching climate neutrality by 2050.

It supports the transformation of the EU into a fair and prosperous society with a modern and competitive economy.

It underlines the need for a holistic and cross-sectoral approach in which all relevant policy areas contribute to the ultimate climate-related goal. The package includes initiatives covering the climate, the environment, energy, transport, industry, agriculture and sustainable finance – all of which are strongly interlinked.

Some of the initiatives that affect the development of the project are:

- European climate law

The European climate law regulation turns the political ambition of reaching climate neutrality by 2050 into a legal obligation for the EU.

By adopting it, the EU and its member states committed to cutting net greenhouse gas emissions in the EU by at least 55% by 2030, compared to 1990 levels. This target is legally binding and based on an impact assessment carried out by the Commission.

The main actions included in the regulation are:

- Mapping out the pace of emission reductions until 2050 to give predictability to businesses, stakeholders and citizens
- Developing a system to monitor and report on the progress made towards the goal
- Ensuring a cost-efficient and socially-fair green transition

Following the provisional agreement reached with the European Parliament in April 2021, the Council approved the agreement in May 2021. The regulation is in force.





- European industrial strategy

The EU relies on Europe's industry to lead the transitions towards climate neutrality.

The aim of the EU's industrial strategy is to support the industry in its role as an accelerator and enabler of change, innovation and growth.

Following the publication of the Commission's new industrial strategy published in March 2020, the Council adopted conclusions on the strategy in November 2020. In them, ministers stressed that the principles of sustainability, circularity and environmental protection should support the recovery from the COVID-19 pandemic.

An update to the industrial strategy, published by the Commission in May 2021, is aimed at strengthening resilience and advancing Europe's competitiveness. It strives to enable Europe's industry to lead the green and digital transformation and become the global driving force in the shift towards climate neutrality and digitalisation.



European Industrial Strategy UPDATE

#EUIndustrialStrategy



- Batteries and waste batteries

Demand for batteries is expected to grow by more than ten-fold by 2030. The EU has adopted a regulation on batteries to create a circular economy for the sector by targeting all stages of the life cycle of batteries, from design to waste treatment. This initiative is of major importance, particularly in view of the massive development of electric mobility.



The new regulation adopted in 2023 replaces the current batteries directive of 2006. It aims to both promote a circular economy and improve the functioning of the internal market for batteries ensuring fairer competition thanks to the safety, sustainability and labelling requirements.

The European Commission presented a proposal for the regulation in December 2020. The Council adopted a general approach on 17 March 2022. Following interinstitutional negotiations, a provisional agreement was reached between the Council presidency and European Parliament negotiators. The Council formally adopted the final text in July 2023, completing the legislative procedure.

- A just transition

Achieving climate neutrality by 2050 will be more challenging for some member states and regions than for others. For instance, some are more reliant on fossil fuels, or have carbon-intensive industries, that employ significant numbers of people.

The EU has introduced a just transition mechanism to provide financial and technical support to the regions most affected by the move towards a low-carbon economy. It will help mobilise at least €55 billion over the period 2021-2027 for:

- People and communities – facilitating employment opportunities and reskilling, improving energy-efficient housing and fighting energy poverty
- Companies – making the transition to low-carbon technology attractive for investment, providing financial support for and investment in research and innovation
- Member states or regions – investing in new green jobs, sustainable public transport, digital connectivity and clean energy infrastructure

With an overall budget of €17.5 billion, the just transition fund is the first pillar of the mechanism. It provides tailored support to alleviate the social and economic costs resulting from the green transition for regions dependent on fossil fuels and high-emission industries. It supports investment in:

- SMEs and new firms
 - Research and innovation
 - Clean energy technologies and emissions reduction
 - Reskilling of workers and job-search assistance
- Clean, affordable and secure energy

As 75% of EU greenhouse gas emissions come from energy use and production, the decarbonisation of the energy sector is a crucial step towards a climate-neutral EU.

The EU is working at several levels to achieve these objectives:

- Supporting the development and uptake of cleaner energy sources, such as renewable offshore energy and hydrogen
- Fostering integration of energy systems throughout the EU
- Developing interconnected energy infrastructure via EU energy corridors
- Revising the current legislation on energy efficiency and renewable energy, including their 2030 targets



The buildings sector is one of the largest energy consumers in Europe and is responsible for more than one third of the EU's greenhouse gas emissions.



In June 2021, EU ministers approved conclusions on the Commission's renovation wave strategy emphasising the aspects of social inclusion, economic recovery and green transition. Ministers endorsed the aim of the strategy to at least double energy-related renovation rates in the EU by 2030.

- EU chemicals strategy for sustainability

Chemicals are essential to modern living standards and the economy. However, chemical substances can be harmful to people and the environment. In March 2021, the Council adopted conclusions endorsing the EU chemicals strategy for sustainability, as presented by the Commission.

The strategy sets out a long-term vision for the EU chemicals policy, wherein the EU and member states want to:

- Better protect human health
- Strengthen the industry's competitiveness
- Support a toxic-free environment

The strategy is an essential part of the European Green Deal and its zero-pollution ambition.

In June 2023, the Council adopted its negotiating position on the regulation for classification, labelling and packaging of chemical substances. It will allow consumers to purchase chemical products in a safer, better informed and more sustainable way.



- Territorial Agenda 2030 - A Future for all Places

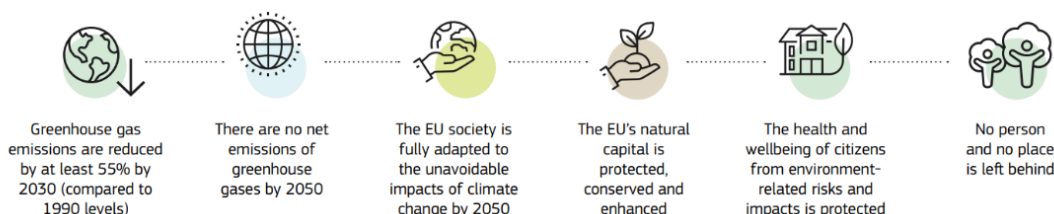
The Territorial Agenda 2030 is a strategic framework document that underlines the importance of and provides orientation for strategic spatial planning and calls for strengthening the territorial dimension of sector policies at all governance levels. It seeks to promote an inclusive and sustainable future for all places and help achieve Sustainable Development Goals in Europe. The Territorial Agenda contributes to key European objectives, a Just Europe that offers future perspectives for all places and people, and a Green Europe that protects common livelihoods and shapes societal transition.

Pilot actions composed of several countries and partners were launched to accompany the Territorial Agenda. Pilot actions develop, showcase and further inspire stakeholders across Europe to implement the Territorial Agenda priorities. They demonstrate how the territorial dimension of regional, national and European policies can be addressed. Everybody is encouraged to follow these actions, take inspiration and offer proposals for new actions.



- The EU Taxonomy

The EU Taxonomy Regulation, for instance, establishes a framework for determining whether an economic activity is environmentally sustainable. It provides criteria for assessing the sustainability of activities in sectors such as energy, transportation, agriculture, and more. This taxonomy aims to direct investments toward green initiatives, aligning with the goals of the Green Deal to achieve climate neutrality and environmental sustainability.



The taxonomy helps investors, businesses, and policymakers by providing a common language and standard for what qualifies as environmentally sustainable economic activities. By creating transparency and clarity, it assists in directing funding and resources toward projects that contribute to the transition to a more sustainable economy, a key aspect of the Green Deal.

Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 (hereinafter referred to as the "Taxonomy Regulation") can be described as the basic legal implementation of the taxonomy, which "sets out the criteria for determining whether an economic activity qualifies as environmentally sustainable, for the purpose of determining the extent to which an investment is environmentally sustainable."

11.2. NATIONAL, REGIONAL AND LOCAL POLICIES

Each of Member States has an obligation to implement the EU legislation into a national legislation. The European Commission may initiate infringement proceedings under Article 258 against a Member State that fails to implement the Directive in time. The Court of Justice may then decide to impose a substantial financial penalty on the basis of the action.

The Commission launched 28 infringement proceedings against Member States in relation to the implementation of the WEEE Directive. It referred three cases to the European Court of Justice for failure to notify national transposition and withdrew from these proceedings after the three Member States concerned had transposed the Directive. As of December 2020, three cases of incorrect transposition of the Directive remained pending.

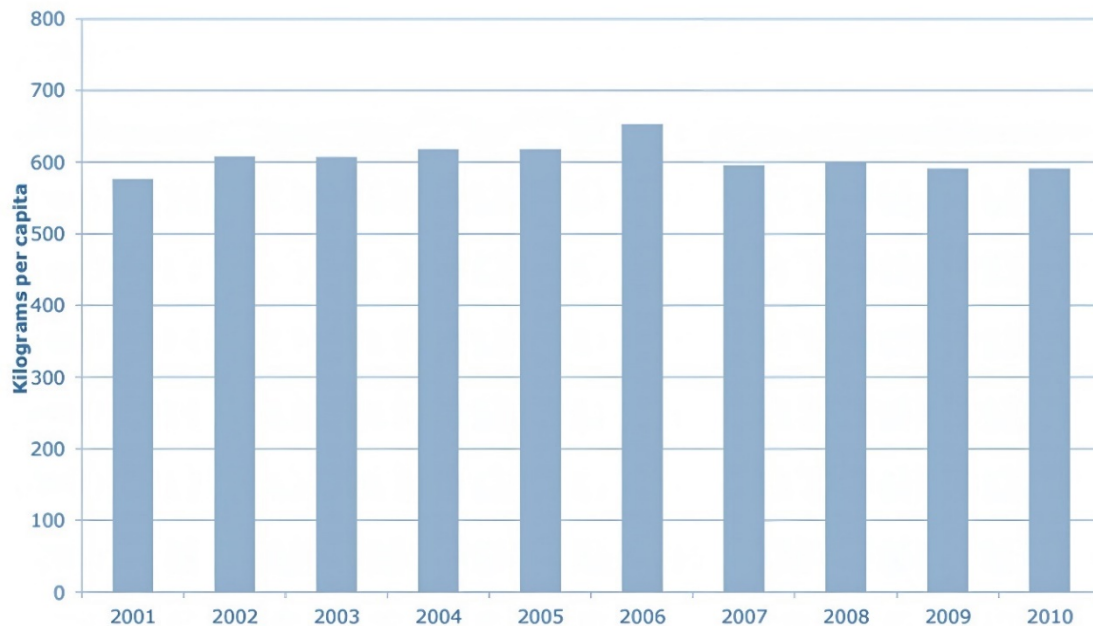
AUSTRIA

The Austrian Regulations on Waste Prevention, Collection, and Treatment of WEEE and Batteries impose several obligations on producers/importers, retailers, and municipalities.

Producers/importers must register online with the Environment Agency Austria, report EEE and portable battery quantities, operate collection points nationwide, arrange agreements with municipalities for waste collection, ensure reuse of WEEE, and provide financial guarantees for collection and recycling. They must also mark new appliances, inform consumers, and comply with hazardous substance restrictions.



Retailers are required to accept household WEEE free of charge on a 1:1 basis, while municipalities must also accept household WEEE at no cost.



MSW generation in Austria for the period 2001-2010

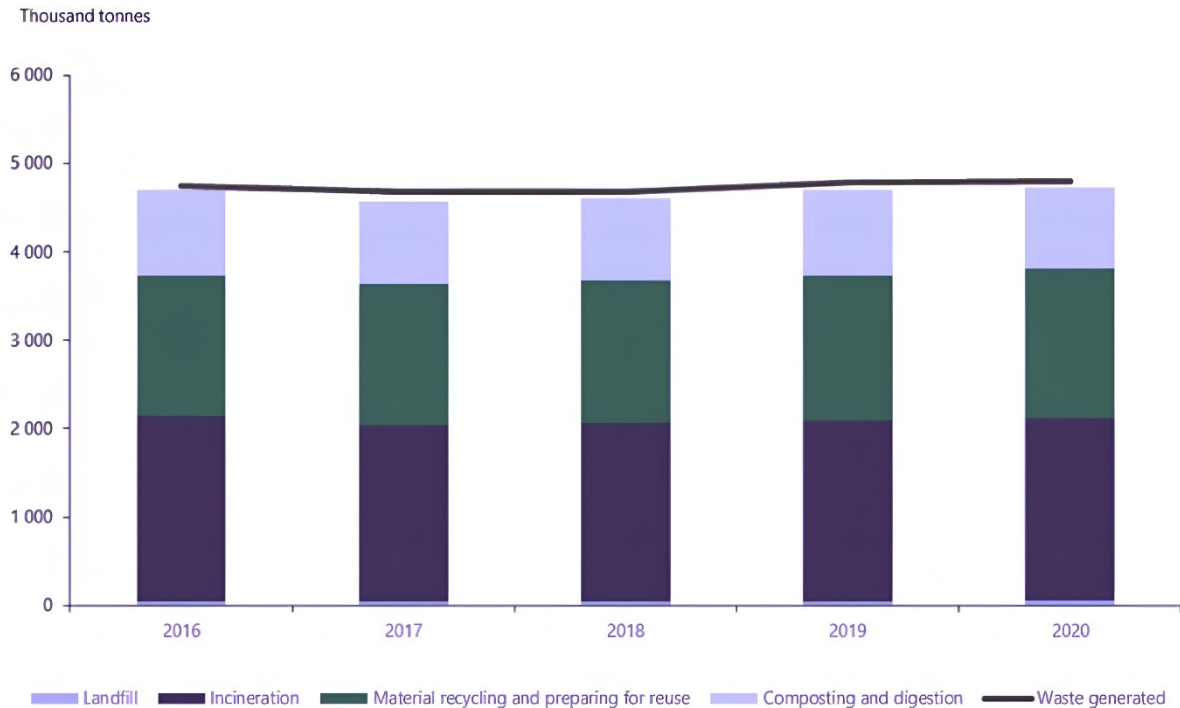
BELGIUM

Flemish Decree on Waste Prevention and Management and the Environmental Policy Agreement (MBO) - an agreement between the 3 regional governments of Belgium and the industry sectors. Decrees regarding the collection and treatment of WEEE for the Walloon Region and the Brussels Capital Region followed in 2002. Based on the legal background and the 'MBO' there is the obligation:

- To organize separate collection of WEEE (for municipalities or municipalities working together)
- To include social economy undertakings in the collection of WEEE,
- To take back a similar product when a new product is purchased (for retailers), and
- To arrange an environmentally sound treatment of WEEE.

Each manufacturer or importer has to join a system for WEEE collection and treatment. Alternatively, manufacturers or importers may establish an individual waste management plan and have it approved by the authorities.





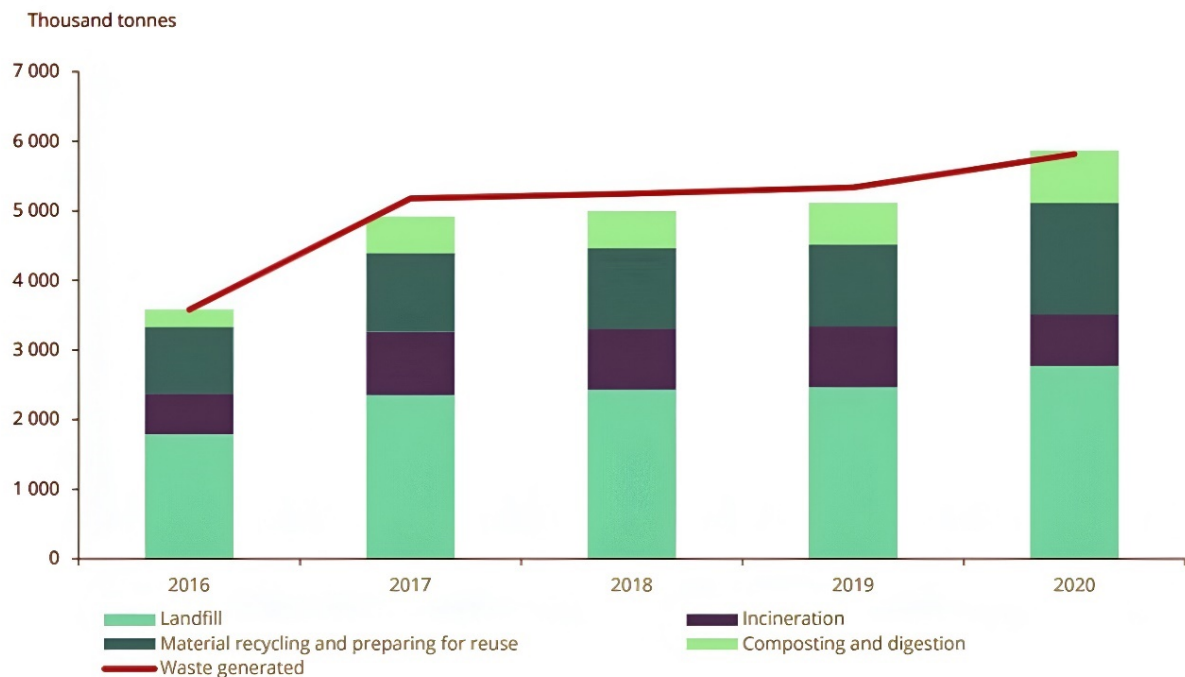
Municipal waste generation and treatment in Belgium between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

CZECHIA

Currently, waste management is regulated by Act No. 541/2020 Coll., on Waste, which is effective from 1 January 2021 and its implementing legislation Decree No. 8/2021 Coll. called as Waste Catalogue, where each waste type has a specific handling method.

Generally, the Waste Act establishes the rights and obligations of persons in the field of waste management and regulates the obligations of waste generators (citizens, municipalities, towns and companies), the obligations of persons who collect, transport, treat, use and dispose of waste (landfills, incinerators, waste collection centres, sorting lines, etc.), the obligations of the public administration and local government and, last but not least, regulates penalties and fees. The Waste Act also promotes the basic principles of circular economy, environmental protection, and human health in waste management.

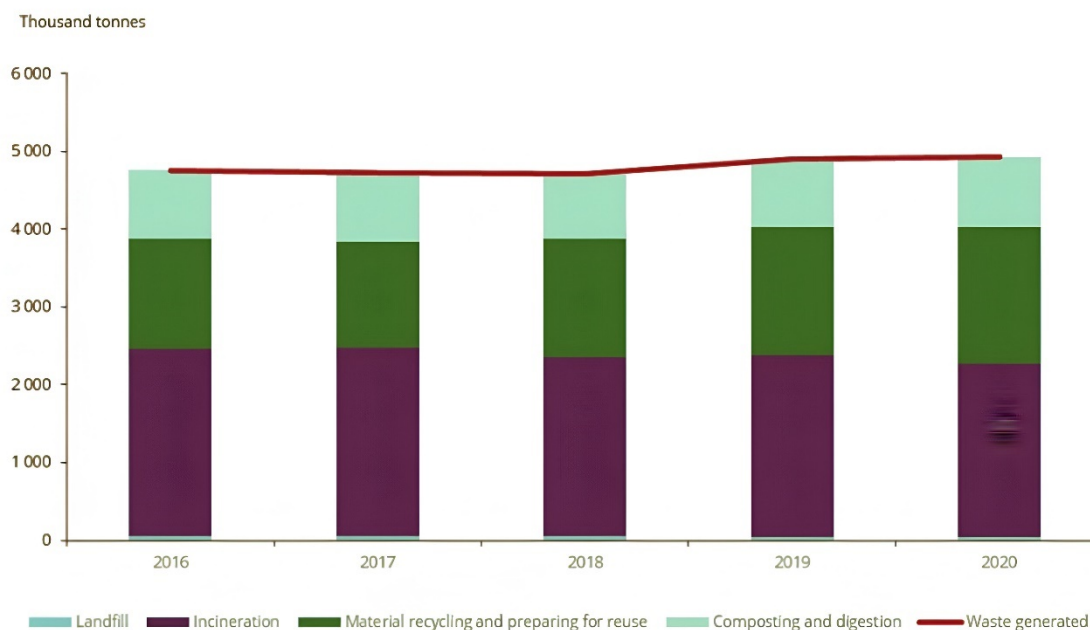




Municipal waste generation and treatment in Czechia between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

DENMARK

The WEEE-directive was transposed into Danish legislation by the below regulations Act no. 385 of 25th May 2005 amending the Environmental Protection Act (Producer liability for electronic waste, etc.) Statutory Order no. 664 of 27th June 2005 on management of waste electrical and electronic equipment (the WEEE Order).



Municipal waste generation and treatment in Denmark between 2016 and 2020, in thousand tonnes. Source: European Environment Agency



FRANCE

The 2012/19/UE Directive published on the 24 July 2012 have been transposed into French law through a decree on the 19 August 2014. It includes obligations for:

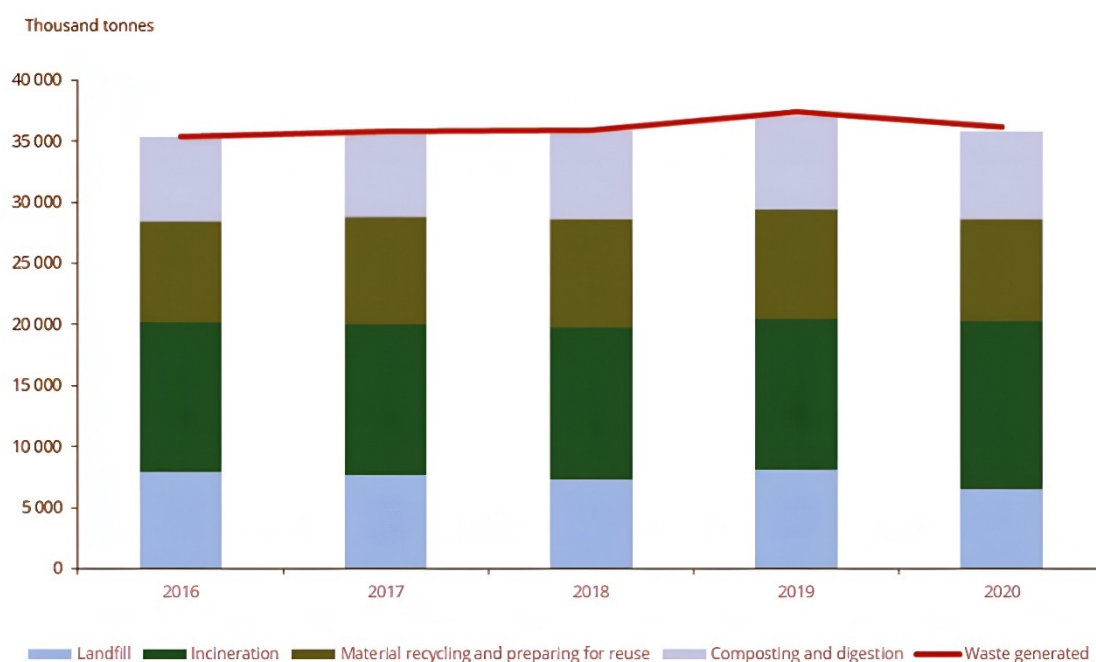
Producers:

- To finance the take-back and the ecological treatment of WEEE according to their current market share for historical WEEE,
- To guarantee the financing of the take-back and treatment of products put on the market.

Retailers:

- To take back household WEEE free of charge on a one-to-one basis,
- For stores with an EEE sale space superior to 400sqm, to take back very small household WEEE free of charge on a one-to-zero basis.

On a voluntary basis, local authorities and municipalities can organize a selective collection of households WEEE, lighting equipment and small fire extinguishers.



Municipal waste generation and treatment in France between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

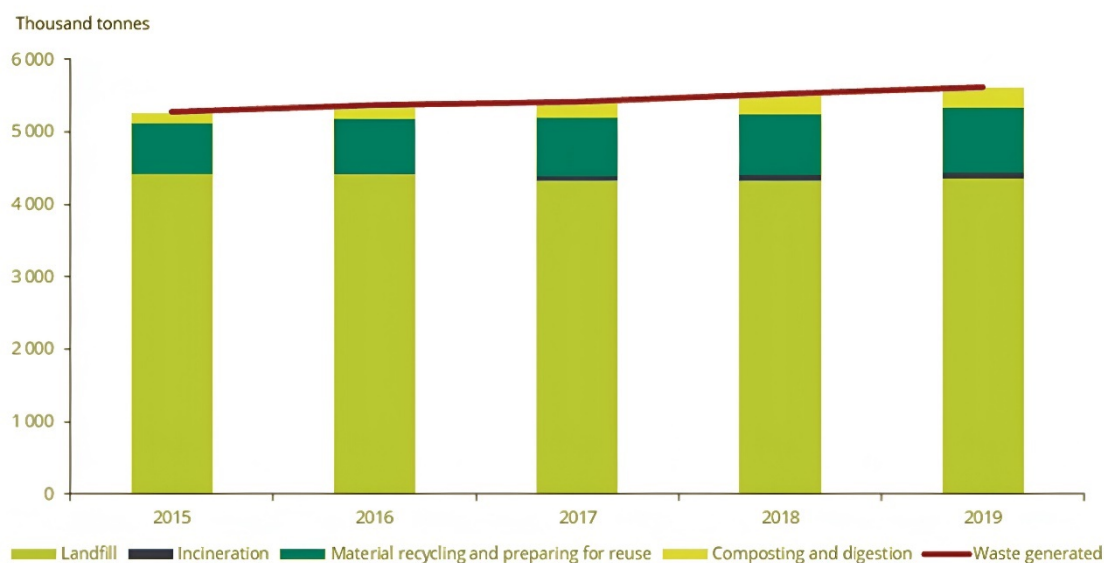
GREECE

Directive 2008/98/EC and Directive 2008/99/EC have been implemented in Greece through Law 4042/2012, which focuses on criminal-law protection of the environment and waste management. The law, consisting of 72 articles divided into four parts, aims to harmonize Greek legislation with EU directives:



- Part I incorporates provisions from EU Directive 2008/99/EC, establishing penalties for activities causing substantial environmental damage.
- Part II aligns Greek legislation with EU Directive 2008/98/EC, aiming to protect the environment and human health through waste prevention, recycling, and control of hazardous waste.
- Parts III and IV introduce amendments to existing legislation and address matters under the jurisdiction of the Ministry of Environment, Energy, and Climate Change.

Overall, Law 4042/2012 seeks to ensure effective environmental protection and sustainable waste management practices in Greece in line with EU directives.



Municipal waste generation and treatment in Greece between 2015 and 2019, in thousand tonnes. Source: European Environment Agency

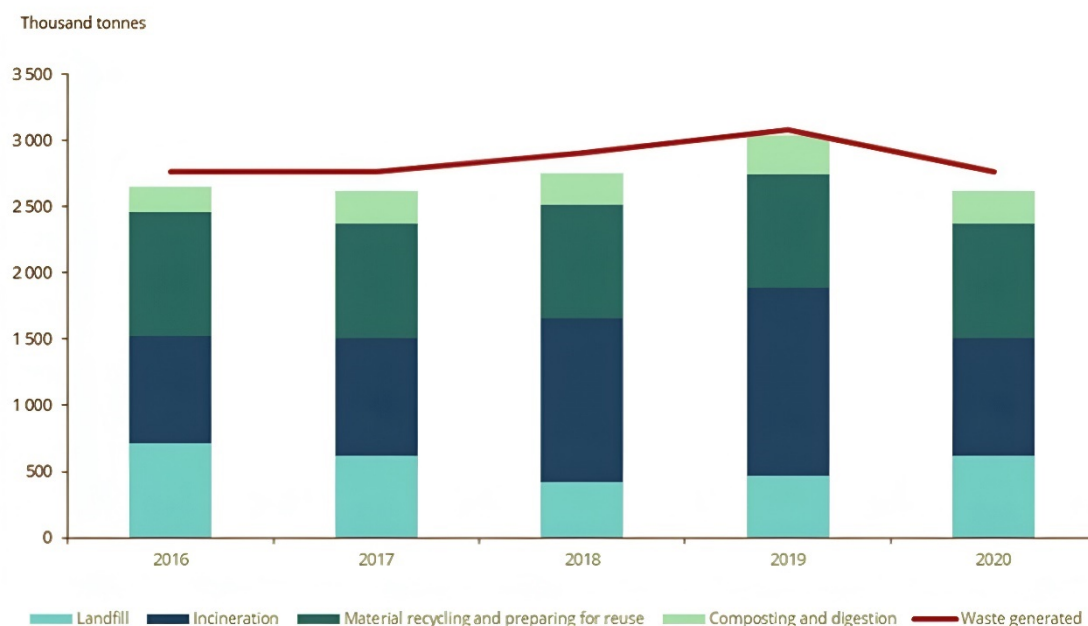
IRELAND

Producer responsibility under WEEE Directive 2012/19/EU & EU Battery Directive 2006/66/EC is transposed in Ireland under WEEE Regulations 2014 S.I. No. 149 of 2014 (as recently amended under S.I. No. 233 of 2019) and Battery Regulations 2014 S.I. No. 283 of 2014 (as amended).

The WEEE Regulations 2014 - S.I. No. 149 of 2014 govern the sustainable production, reuse, recycling and appropriate disposal of WEEE. The WEEE Regulations are in place since 29th March 2014 and replace the 2005 and 2011 WEEE Regulations. As of the 31st of May 2019, the Iris Oifigiúil published the amended S.I. No. 233 of 2019 of the 2014 WEEE Regulations 2014 for the purposes of giving full effect to Directive 2012/19/EU on waste electrical and electronic equipment.

The European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014), as amended came into effect on 30th July 2014 in Ireland and promote the recycling of waste batteries. In particular, they also facilitate the achievement of targets for the collection, treatment, recycling and disposal of waste batteries in an environmentally sound manner.





Municipal waste generation and treatment in Ireland between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

ITALY

The Legislative Decree 49/2014 in Italy transposes Directive 2012/19/EU, aiming to protect the environment and human health by regulating the production of Electrical and Electronic Equipment (EEE) and associated waste from households and businesses. Several Ministerial Decrees complement the legislative framework, focusing on aspects relevant to producers:

Financial Guarantees Decree (Ministerial Decree No. 68 of March 9, 2017): This decree specifies the requirements for EEE producers to provide financial guarantees, particularly for WEEE from private households, excluding professional WEEE.

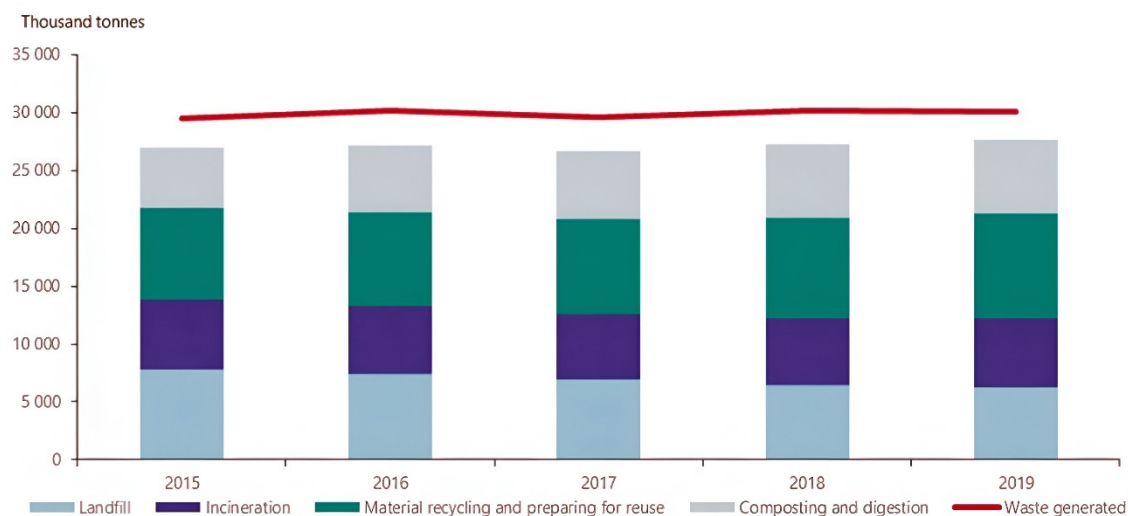
Rates Decree (Ministerial Decree of June 17, 2016): This decree establishes charges and payment methods to cover the operating costs of various committees and activities related to WEEE management, including supervision, control, monitoring, and inspections.

'One-for-Zero' Decree (Ministerial Decree No. 121 of May 31, 2016): This decree outlines simplified procedures for distributors to take back small-sized WEEE from households free of charge, without requiring the purchase of an equivalent product.

'One-for-One' Decree (Ministerial Decree 65/2010): This decree provides guidelines for the free take-back of WEEE from private households by distributors, EEE installers, and assistance center operators when purchasing an equivalent product, ensuring the proper disposal of old equipment.



These ministerial decrees complement Legislative Decree 49/2014 by establishing specific measures and procedures to ensure effective implementation and compliance with EU directives, contributing to the reduction of negative environmental impacts associated with EEE production and waste management.



Municipal waste generation and treatment in Italy between 2015 and 2019, in thousand tonnes. Source: European Environment Agency

LITHUANIA

The Law on Waste Management (No. VIII-787) establishes fundamental guidelines for the prevention, handling, and disposal of waste to mitigate its negative impact on the environment and human health. It outlines the roles and responsibilities of public authorities and other entities involved in waste management, setting forth regulations for waste prevention, organization of waste management systems, and economic measures related to waste management.

The law covers various types of waste, including oils, electrical and electronic equipment, vehicles, disposable plastic products, and packaging. Its primary objective is to ensure compliance with relevant European Union regulations and standards. Additionally, the law mandates the prohibition of products made of aerobically degradable plastic and requires waste facilities to safely treat hazardous waste to protect public health and the environment.

LUXEMBOURG

Pursuant to the Law of 21 March 2012 on waste, as amended, and the Law of 9 June 2022 on waste electrical and electronic equipment, waste electrical and electronic equipment (WEEE) is subject to the principle of extended producer responsibility. The modified Luxembourgish regulation initially transposing the directives 2002/95/CE and 2002/96/CE and now the directive 2012/19/EU forces:

Producers and importers:

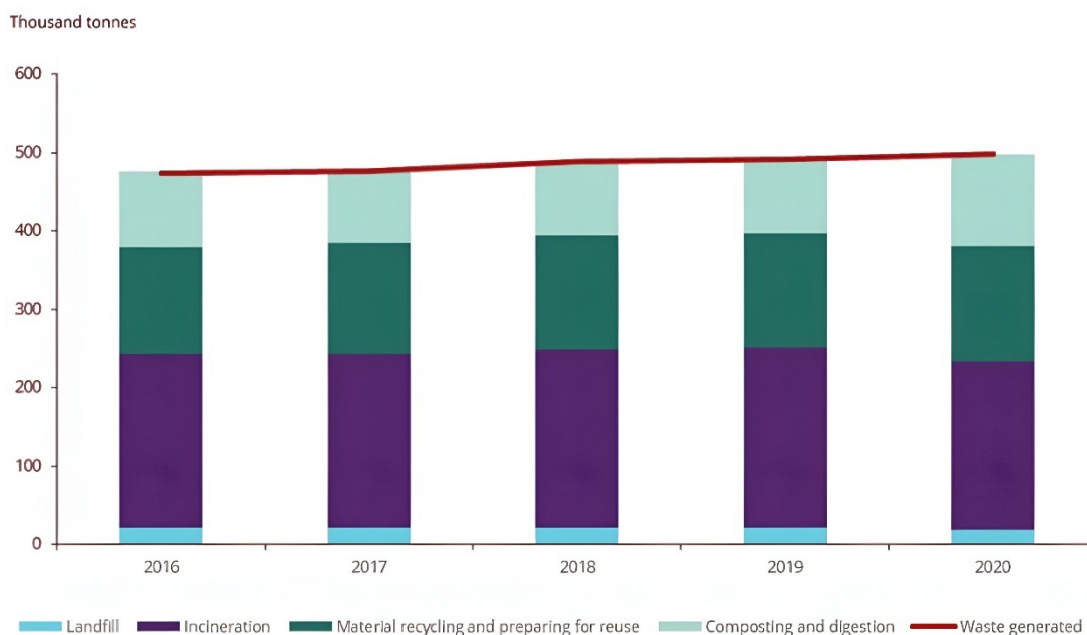
- To finance the take-back and treatment of WEEE from the exit of the selective collection points according to their current market share for the historical WEEE
- To provide a guarantee for the take-back and treatment of appliances placed on the market after the 13th of August 2005



Retailers to take back free of charge WEEE from household on a one-for-one basis and all WEEE smaller than 25 cm even if there is no purchase of a new appliance.

Municipalities to take back free of charge all WEEE from households and to sort and store them.

A voluntary agreement has been signed between the ministry of environment, the municipalities and the private sector. This agreement specifies the rights and obligations of each stakeholder.



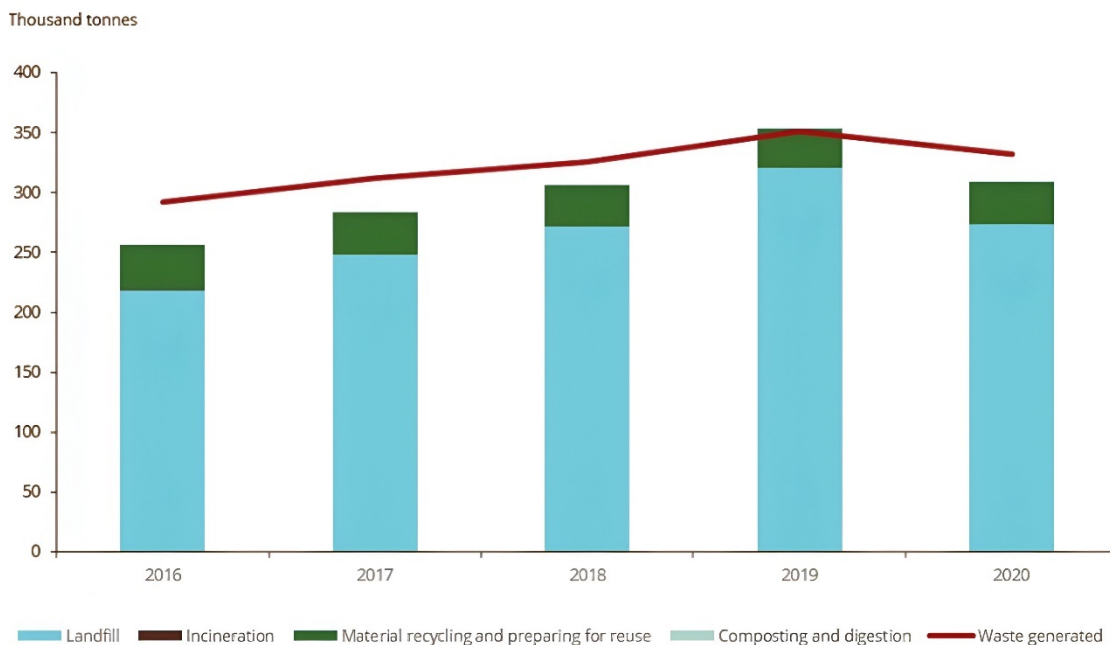
Municipal waste generation and treatment in Luxembourg between 2016 and 2020, in thousand tonnes.

Source: European Environment Agency

MALTA

The WEEE Directive (Recast) was transposed into Maltese Law through Legal Notice 204 of 2014 updating the Subsidiary Legislation 549.89. The legislation came into force as of 14th February 2014 and subsequently also repealed Legal Notice 63 of 2007. Additional regulations to the Subsidiary Legislation 549.89 were through Legal Notice 532 of 15 bringing into effect the provisions of Directive 2012/19/EC of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment and repealing Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003. S.L. 549.63(2). Producers' obligations came into force on 1st September 2015.



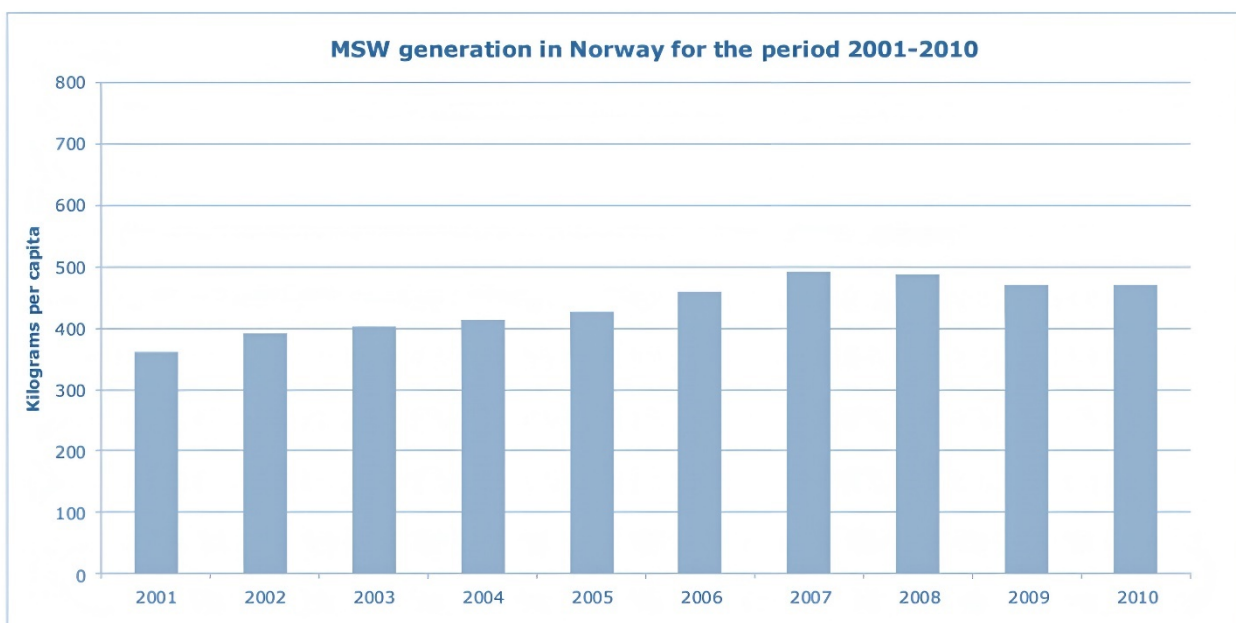


Municipal waste generation and treatment in Malta between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

NORWAY

WEEE take-back has been part of Norwegian regulations since 1998 and is now subject to the national Waste Regulations FOR-2004-06-01-930, Chapter 1. Waste electrical and electronic equipment (WEEE directive 2012/19/EU).

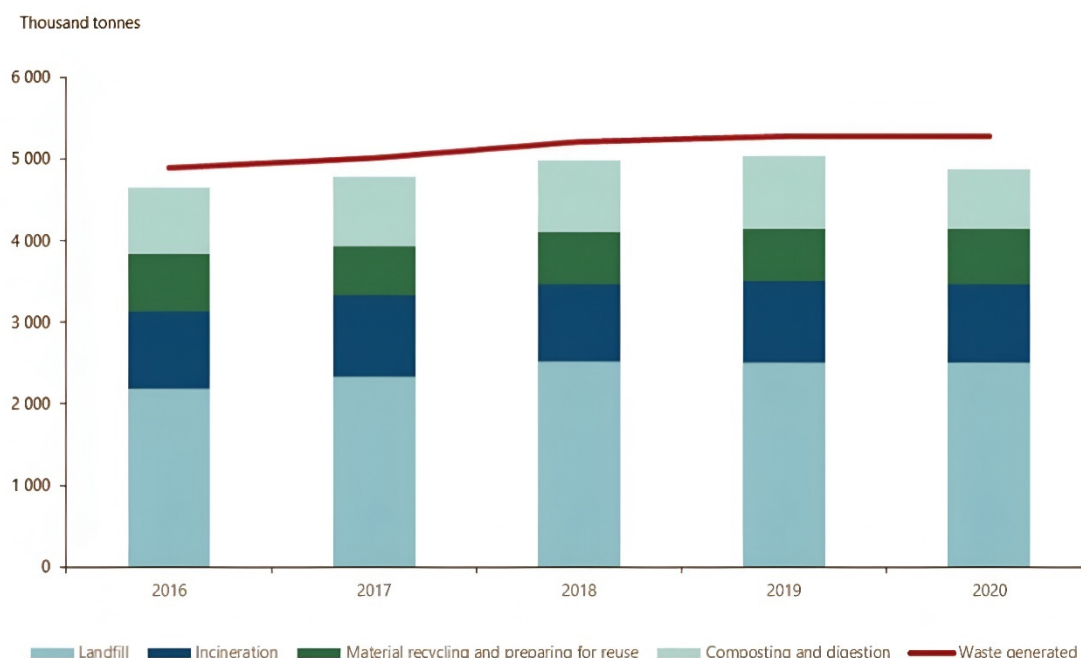
- Producers are to finance the take-back, sorting, and correct treatment of put on market for WEEE.
- Retailers and municipalities to free of charge take back WEEE from households



PORTUGAL

The WEEE European legal frame, defined by Directive (2012/19/CE), where transposed into law in Portugal on December 2017 by Law Decree n° 152-D/2017, 11 December. This diploma established the conditions for the organization and management of an Integrated Waste Electric and Electronic Equipment Management System (SIGREEE).

This legislation is the fifth update to Decree-Law No 152-D/2017 of December 11, 2017, introducing the requirement to mark reusable packaging and packaging managed under the deposit system, as well as the requirement to mark recyclable packaging with the indication of its appropriate destination. The draft Decree-Law also provides for the obligation for waste treatment operators to prove annually to the licensing entity that they have complied with the qualification requirements and applicable standards by means of a document issued by qualified verifiers.



Municipal waste generation and treatment in Portugal between 2016 and 2020, in thousand tonnes.

Source: European Environment Agency

ROMANIA

EU Directive 2012/19/EU has been transposed into Romanian legislation through Emergency Ordinance no. 5, which was published on April 16, 2015. This ordinance introduces measures aimed at protecting the environment and public health by mitigating the negative impacts of waste electrical and electronic equipment (WEEE) generation and management.

Among its provisions, Emergency Ordinance no. 5 places specific obligations on producers of electrical and electronic equipment, including:

- Meeting ecological protection requirements to facilitate the reuse and treatment of WEEE.

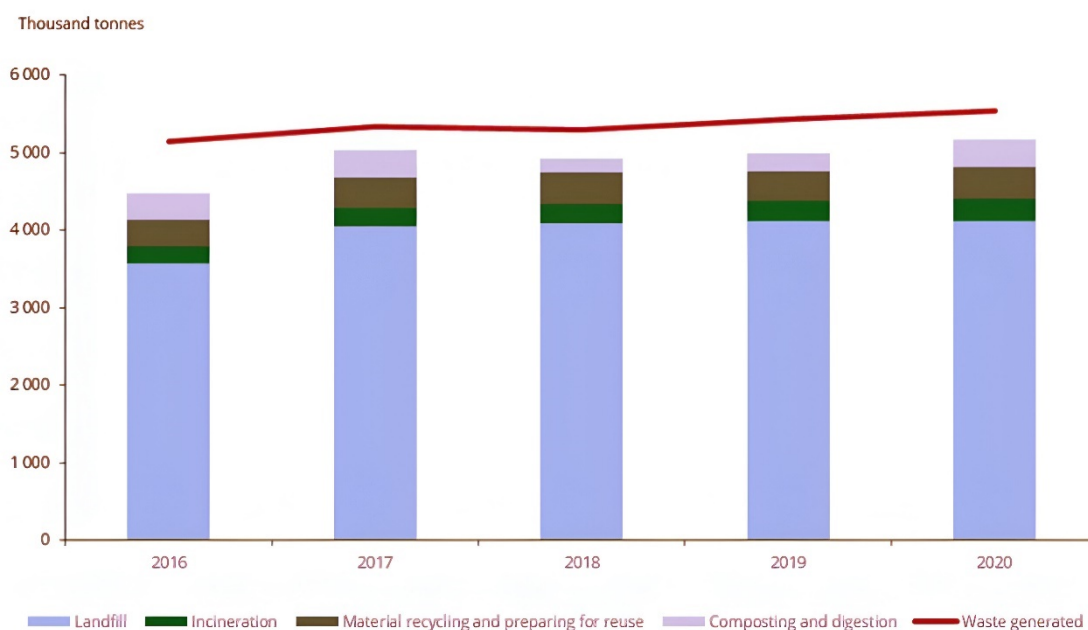


- Avoiding design features or manufacturing procedures that hinder the reuse of WEEE, except where such features or procedures offer clear advantages, such as safety requirements.
- Implementing waste collection from private households to achieve a minimum average annual rate of separate waste collection at the national level.

Furthermore, retailers are mandated to accept WEEE on a "one-for-one" basis from customers, free of charge, provided the equipment is of an equivalent type and serves the same function as the newly purchased product. Retailers with retail spaces exceeding 400 square meters must also offer collection services for small WEEE from end-users, without any obligation to make a purchase.

Additionally, all economic operators involved in the collection and transport of separately collected WEEE must ensure optimal conditions for preparing the equipment for reuse or recycling, including the proper isolation of hazardous substances.

Overall, Emergency Ordinance no. 5 seeks to align Romanian legislation with EU directives, promoting responsible waste management practices and environmental protection.



Municipal waste generation and treatment in Romania between 2016 and 2020, in thousand tonnes.

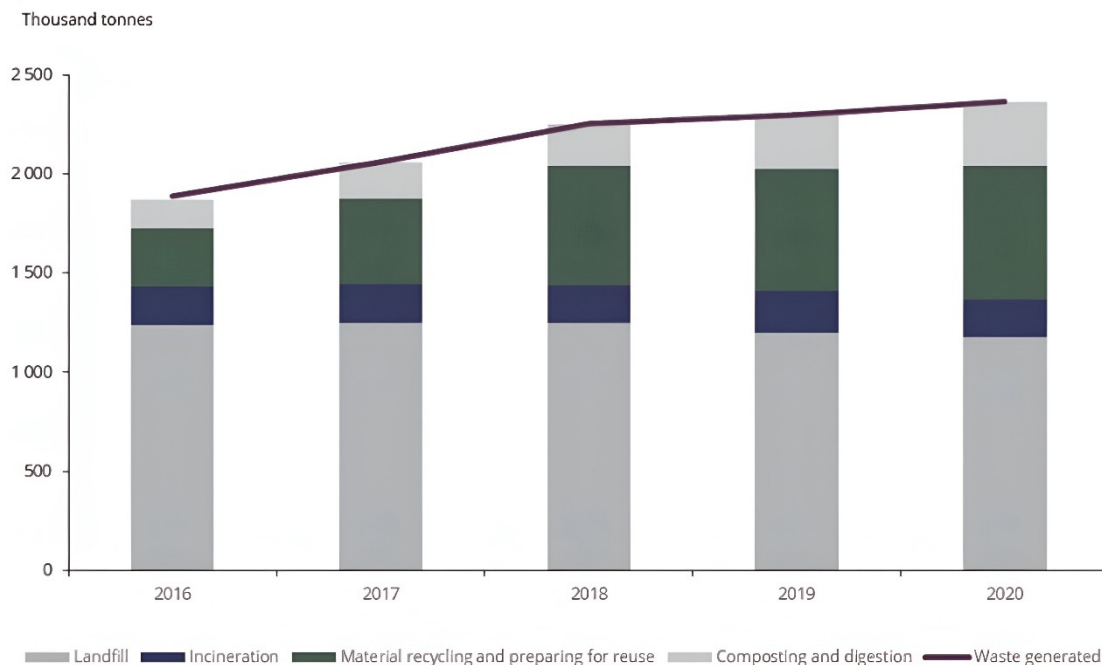
Source: European Environment Agency

SLOVAKIA

The Slovak government established the Act on Waste No. 223/2001 in 2001 to regulate waste management. The WEEE Directive was incorporated into Slovak law through an amendment to this act in 2004. Subsequently, in 2015, the new Act on Waste No. 79/2015 was introduced, accompanied by several decrees issued by the Ministry of Environment. These decrees cover various aspects related to WEEE, such as applications and permits for waste handling, waste cataloging, waste evidence and reporting, and extended producer responsibility. The legislation outlines the obligations of producers and importers to ensure the proper handling, collection, recycling, and disposal of WEEE, as well as the responsibility of consumers to return end-of-life appliances. Producers'



obligations are determined by their market share, and permits and authorizations are required for producer responsibility organizations. However, municipalities are not obligated to provide separate collection of WEEE, although they must offer their collection capacities to producers/importers and may request compensation. Similarly, retailers are not mandated to accept returned appliances.

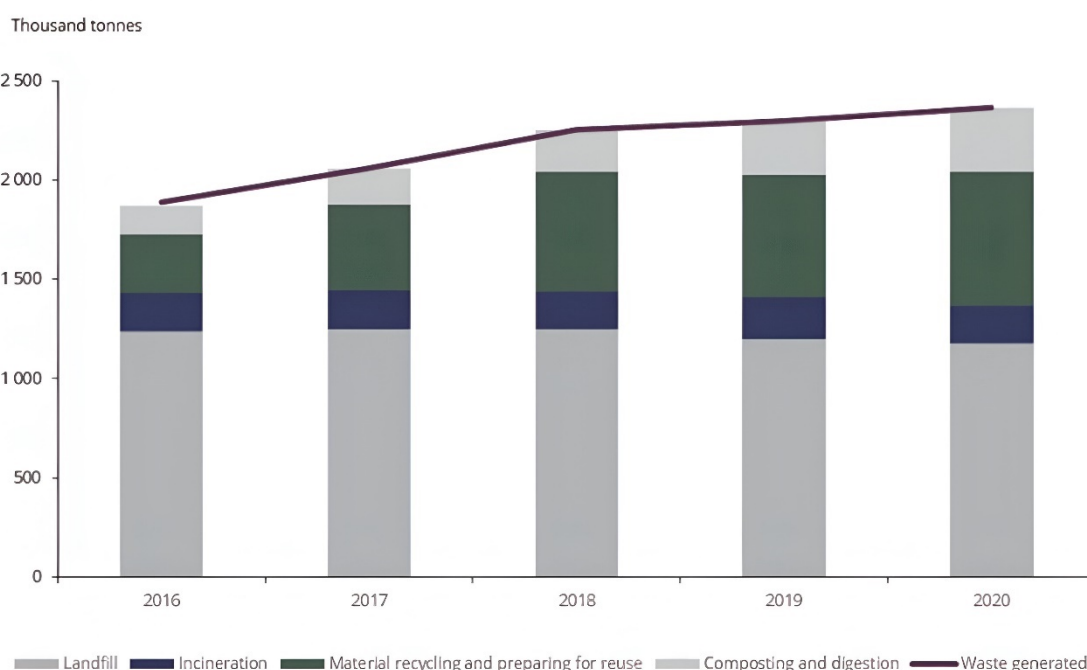


Municipal waste generation and treatment in Slovakia between 2016 and 2020, in thousand tonnes.

Source: European Environment Agency

SLOVENIA

The WEEE directive has been transposed into Slovenian law on November 4th 2004 through "THE DECREE on treatment of Waste Electrical and Electronic Equipment" (the





decree is applicable from November 2nd 2006 onwards) and Decree of environmental tax for Waste Electrical and Electronic Equipment. Transposition of new Directive 2012/19/EU is not finished yet. Decree on treatment of waste batteries and accumulators is applicable from 15.8.2008.

Municipal waste generation and treatment in Slovenia between 2016 and 2020, in thousand tonnes.

Source: European Environment Agency

SPAIN

The Spanish law transposed the WEEE Directive 2002/96/CE through Royal Decree 208/2005 on February 25, 2005. Subsequently, the update of the WEEE Directive in February 2012 was transposed into Spanish law through RD 110/2015.

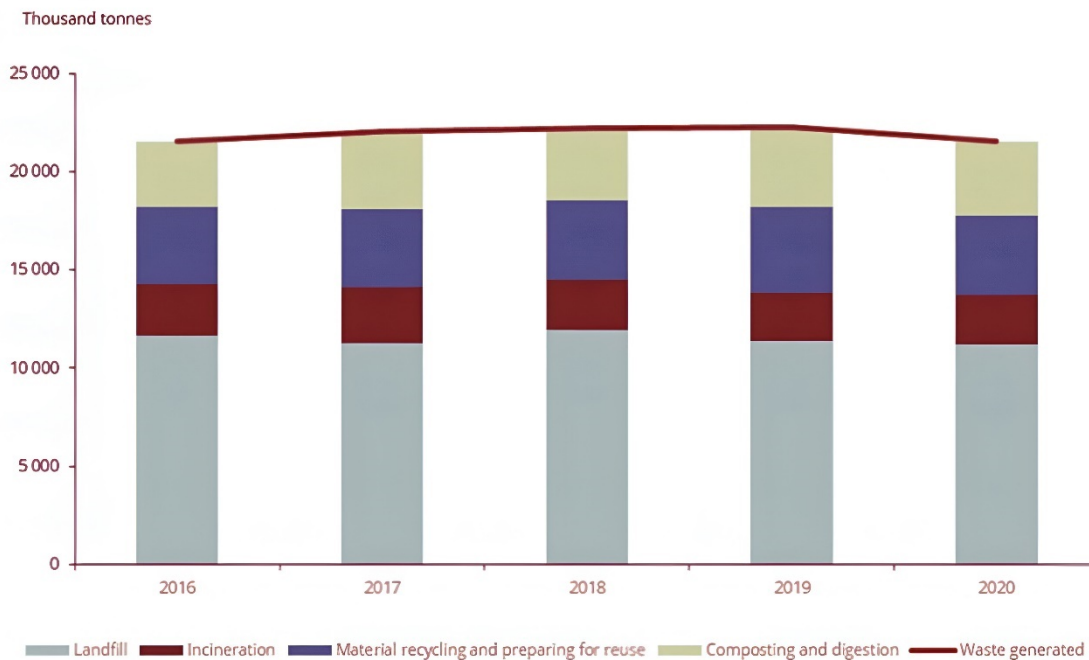
The Royal Decree aims to achieve several immediate objectives:

- Clarify regulations to increase legal certainty and define obligations for various stakeholders.
- Integrate a single control instrument for regional and national WEEE data to ensure compliance and traceability.
- Promote re-use and preparation for re-use, fostering the establishment of re-use centers and job creation.
- Systematize reporting obligations for EEE producers and WEEE managers on collection and recovery throughout the country.
- Optimize and efficiently manage WEEE under extended producer responsibility, ensuring competitiveness while meeting EU objectives.

These objectives will be accomplished through the establishment of a WEEE management model that updates existing practices, ensuring environmental protection and compliance with EU standards. Key changes include the creation of a working group under the coordination commission on waste, the implementation of an electronic platform for waste information and traceability, and the possibility for local authorities to entrust waste management to EEE producers or WEEE managers directly.



The Royal Decree aims to enhance WEEE management in Spain, aligning with EU directives and optimizing resources provided by EEE producers, while fostering sustainable waste management practices.



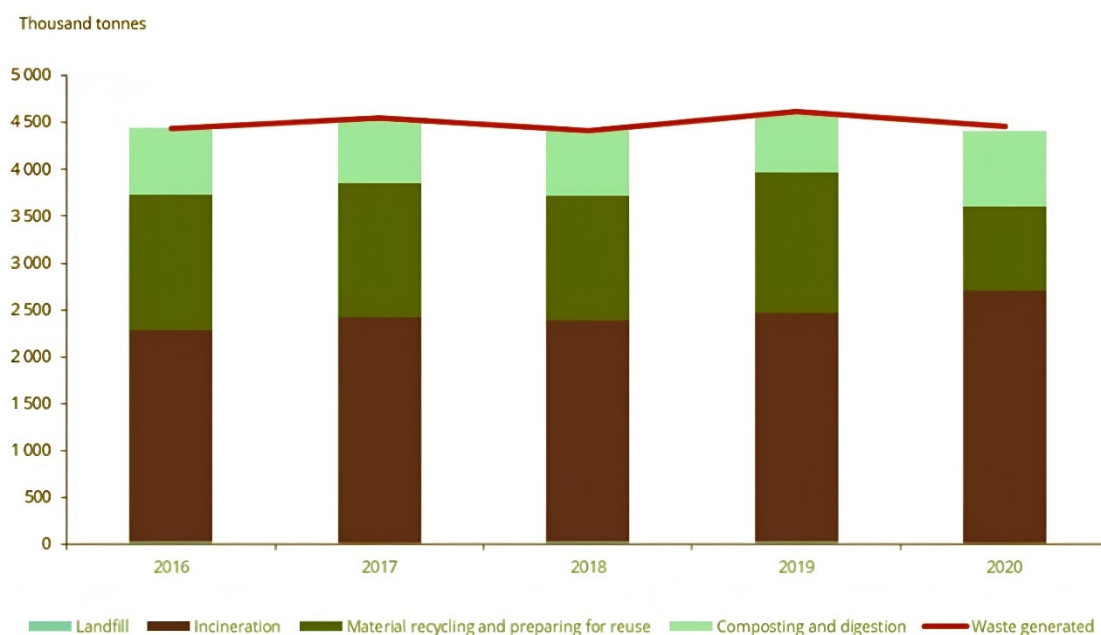
Municipal waste generation and treatment in Spain between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

SWEDEN

The Swedish Ordinance on Producers Responsibility 2005:209 transposes the EU Directive on WEEE into national legislation. The Ordinance strictly follows the EU Directive.

Producers of household electrical and electronic equipment (EEE) in Sweden bear financial responsibility for the waste generated by their products, whether sold before or after August 13, 2005. They must participate in an approved WEEE collection system, provide product content information to waste management operators within a year of sales commencement, label their products, and design them for easy recycling and reuse. The Swedish EPA oversees this responsibility and charges inspection fees. Electrical and electronic equipment not intended for household use falls under different regulations, with the Swedish EPA also supervising collection responsibilities and inspection fees. Additionally, products with integrated batteries are subject to both EEE and battery producer responsibility regulations.





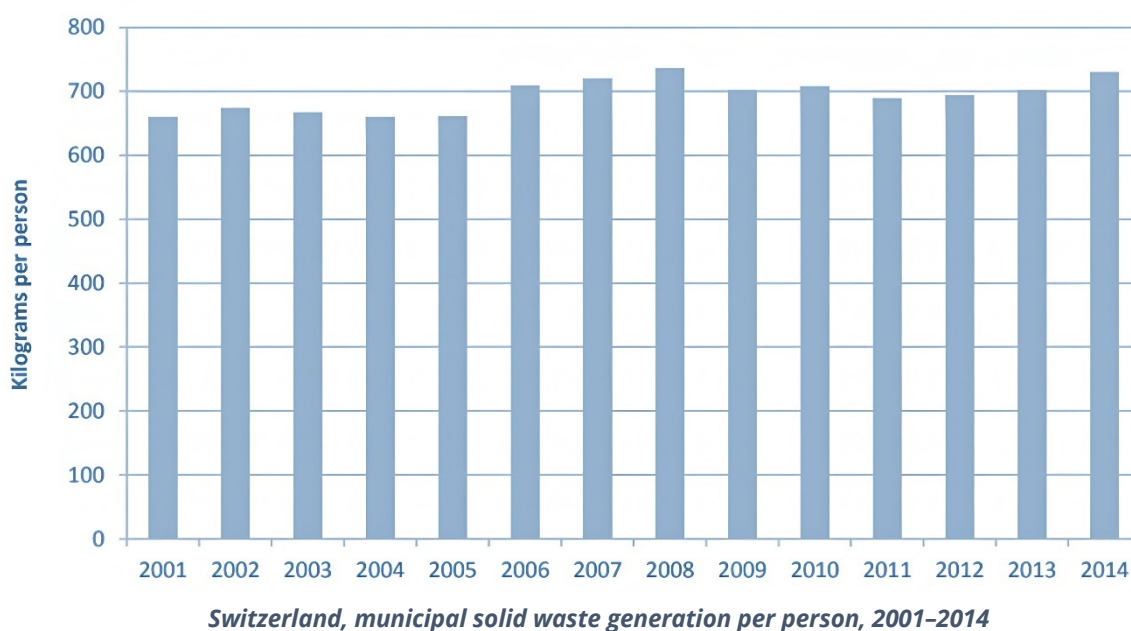
Municipal waste generation and treatment in Sweden between 2016 and 2020, in thousand tonnes. Source: European Environment Agency

SWITZERLAND

On 1 July 1998 the ORDEE came into force (Ordinance on the return, the taking back and the disposal of electrical and electronic equipment). It has been amended to incorporate tighter regulations with effect as of 1 January 2005, and pursues the same objectives as the European WEEE Directive.

The ORDEE is made up of responsibilities at five different levels: 1. Consumers must hand in used equipment to the trade. 2. Distributors, retailers and manufacturers must take back used equipment free of charge (even if no new equipment is purchased). 3. Distributors, retailers and manufactures must professionally dispose of equipment that is taken back. 4. Recycling companies must be in possession of a cantonal license. 5. Exporters must be in possession of a license issued by the federal authorities.





11.3. IMPLEMENTATION LEVEL OF POLICIES

11.3.1. Collection rates (EU)

The WEEE Directive allows EU Member States to report their collection rates using one of two methods. The first, known as the “WEEE Generated method,” measures the amount of WEEE collected in a given year as a percentage of the total WEEE generated that same year. Using this approach, collection performance has improved notably—from 40% in 2014 to 54% by 2021—mainly due to collection volumes increasing more quickly than the amount of waste being generated.

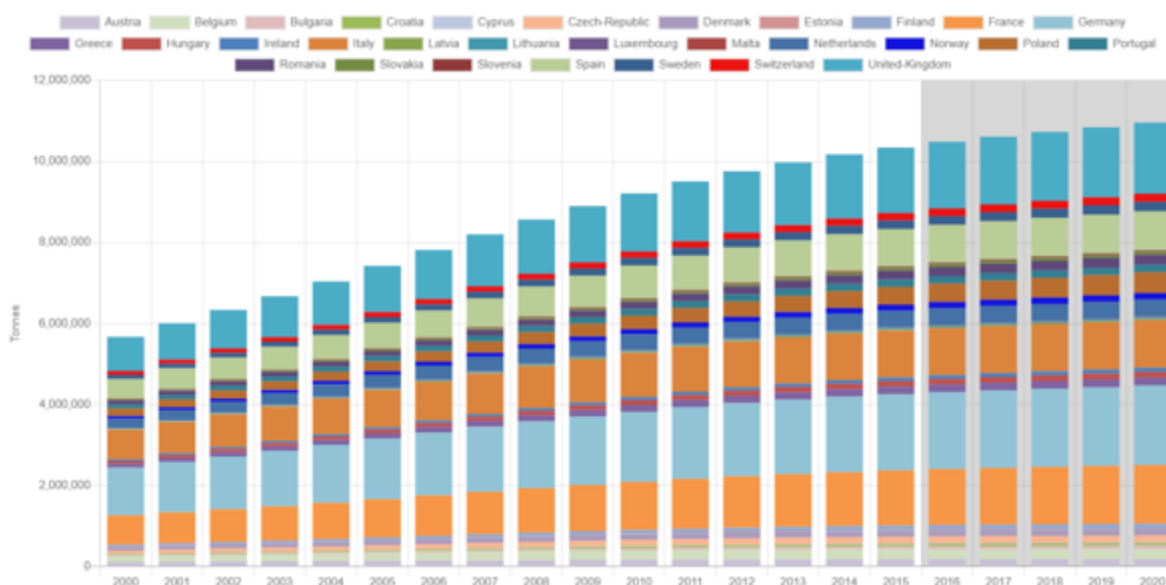
The second method, the “EEE Placed on Market (POM) method,” calculates the collection rate by dividing the mass of WEEE collected by the average volume of electrical and electronic equipment placed on the market over the previous three years. This approach showed progress from 39% in 2013 to 50% in 2016, but the rate fell back to 44% by 2020. The decline occurred even though more WEEE was collected—because the amount of new EEE being sold rose even more sharply, which lowered the overall ratio.

Each year, Member States can decide which method to apply for their official reporting. The target thresholds differ: 85% for the WEEE Generated method, and 65% for the EEE POM method since 2019.

Despite these frameworks, only three out of 27 EU Member States—Croatia, Bulgaria, and Poland—have achieved the collection targets, according to the latest data. Notably, Switzerland, although not bound by the EU Directive, would meet the targets under these metrics. The fact that countries reaching their goals don’t always reflect wider EU trends points to inconsistencies in collection practices or reporting systems.

A key barrier to meeting collection goals is that a significant portion of WEEE bypasses formal systems, often ending up in undocumented streams such as metal scrap recycling. It’s estimated that about 1.4 million tonnes of WEEE, or 2.7 kilograms per person, are collected alongside metal scrap and recycled outside the formal framework—without adhering to environmental and material recovery standards required for properly managed WEEE.





Weight of EEE - Waste Generated. Source: <http://www.urbanmineplatform.eu/urbanmine/eee/weightpercountry>

Moreover, roughly 0.8 million tonnes (about 1.5 kg per person) of WEEE likely ends up in residual waste streams, meaning it is sent to incinerators or landfills. Illegal exports also represent a big unknown, with estimates of around 0.5 million tonnes (1 kg per inhabitant) leaving the EU unlawfully. Another 0.6 million tonnes (1.1 kg per person) of electrical and electronic equipment is exported legally for reuse, but tracking these exports remains difficult since most countries lack specific trade codes for used EEE.

Improved monitoring of used-EEE exports is crucial. It would help distinguish between legal exports of used equipment—which should not count as waste in the country where it was sold initially—and illegal WEEE exports, which often end up dumped in countries without proper waste management systems.

In a previous study from 2019, about 2.7 million tonnes of WEEE had an unknown fate. That figure has now dropped to 1.5 million tonnes (around 1.9 kg per inhabitant) for 2021. This remaining unknown could be a mix of undocumented flows like illegal exports, scrap recycling, or uncertainties in data reporting.

11.3.2. Problems, barriers, achievements (EU)

Consumer relationships with electronics

Like fast fashion and fast food, consumer electronics are caught in a cycle of rapid innovation and constant turnover. Manufacturers frequently release new models and styles, pushing the latest trends and encouraging consumers to upgrade regularly. At the same time, falling prices have made electronic products increasingly accessible—especially in developing countries.

This affordability has fueled opportunities. For instance, mobile technology has played a major role in boosting financial inclusion through mobile banking. In many regions, thriving secondhand markets for smartphones, laptops, and other devices help extend the life of electronics—sometimes through multiple ownership cycles.

Still, no matter how many lives a device has, its journey ends as waste.

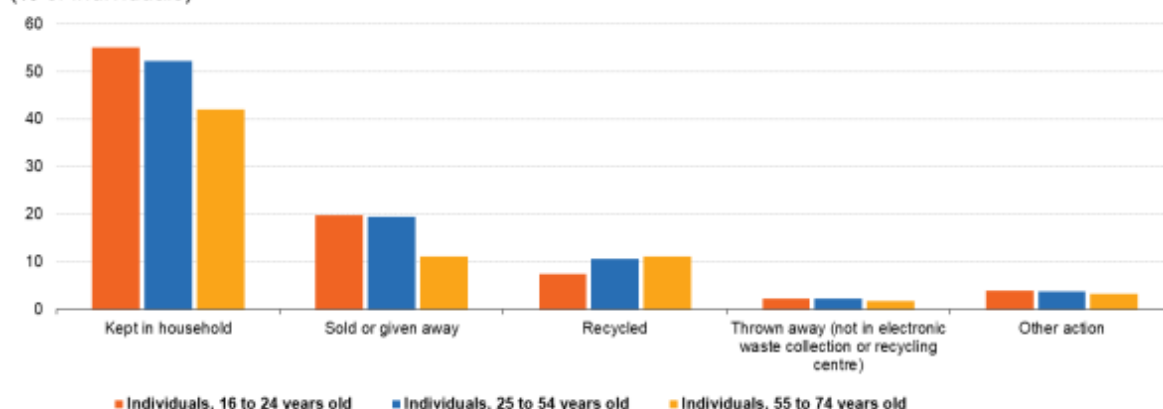
According to one report, the global consumer electronics market was valued at around \$1.1 trillion in 2017, with annual growth of about 6%. By 2024, it was projected to reach \$1.7 trillion. Smartphones are a key driver behind this surge, alongside growing demand



for flat-screen TVs in wealthier countries and wider rollout of 3G and 4G networks in developing ones. Meanwhile, electric vehicles are on the rise, and electronic components are increasingly embedded in everyday products—from furniture and clothing to toys, sports equipment, and even toothbrushes.

Methods of disposing of a mobile/smartphone no longer in use, by age group, 2022

(% of individuals)



Source: Eurostat (online data code: isoc_eco_dd)

Lack of recycling

Globally, e-waste recycling rates remain alarmingly low. Even in the European Union—considered a leader in e-waste management—only about 35% of electronic waste is officially collected and properly recycled. Worldwide, the average drops to just 20%, meaning roughly 80% of e-waste vanishes into informal channels or ends up in landfills, where it can persist for centuries.

Electronic waste doesn't decompose naturally, and as devices become more compact and complex, the challenge continues to grow. Recovering valuable materials from e-waste is technically demanding and often costly. Certain components—especially plastics mixed with metals and hazardous substances—are particularly difficult to process.

E-waste can contain as many as 60 different elements from the periodic table. Some of these materials, such as flame retardants, are classified as Persistent Organic Pollutants (POPs) and are regulated under international agreements like the Stockholm Convention due to their long-term environmental and health risks.

Public awareness adds another layer of complexity. Many people simply don't know how to properly dispose of electronics. Confusion over recycling procedures, combined with concerns about data security, leads to a huge volume of unused devices sitting idle in homes and offices—stuffed into drawers, closets, garages, and storage rooms.

These abandoned gadgets represent a vast untapped resource. With better infrastructure, clearer guidance, and greater consumer engagement, much of this e-waste could be recovered, reused, or recycled—helping to close the loop in a more circular electronics economy.

Labour, environmental and health issues



Electronic waste contains numerous hazardous substances that can pose serious health risks if not properly managed. Older electronics—such as televisions with lead-lined cathode ray tubes, circuit boards containing lead and chromium, and devices with mercury or cadmium—are particularly concerning. These toxic materials can contaminate water sources, enter food chains, and affect entire communities.

While some of the most harmful substances are being phased out of new products through regulations and industry targets, valuable metals like copper and gold are still predominantly recovered in informal recycling sectors—especially in developing countries. Unfortunately, informal recycling often involves unsafe practices: burning plastic to extract metal, open-air smelting of lead, or using acid baths to dissolve components. These crude methods release toxic chemicals, putting workers' health—and the health of nearby residents—at risk.



Women and children make up a significant portion of the informal e-waste workforce in some regions, with estimates reaching 30%. Exposure to substances like lead and cadmium is common, and some compounds in e-waste are known carcinogens. At informal dumpsites, where metals are recovered through open burning, workers are often found with elevated levels of toxic elements in their blood. These areas also attract food vendors and are often situated close to informal housing, extending the health hazards to entire neighborhoods.

Beyond human health, e-waste also damages the environment. Toxic residues seep into groundwater, pollute soil, and degrade air quality. The full scale of informal employment in this sector remains unclear, but available data suggests there are around 100,000 informal e-waste workers in Nigeria and nearly 690,000 in China, according to estimates by the International Labour Organization (ILO).

Transitioning to a formal, safer recycling industry presents a major opportunity—not only to protect workers but also to create dignified jobs and improve environmental outcomes. It's also essential to consider the climate impact of electronic devices. Every product carries a carbon footprint, most of which is generated during manufacturing. For instance, producing one tonne of laptops can emit up to 10 tonnes of CO₂. Extending product lifespans, using recycled materials, and designing for reparability are crucial steps toward reducing emissions and building a more sustainable electronics sector.

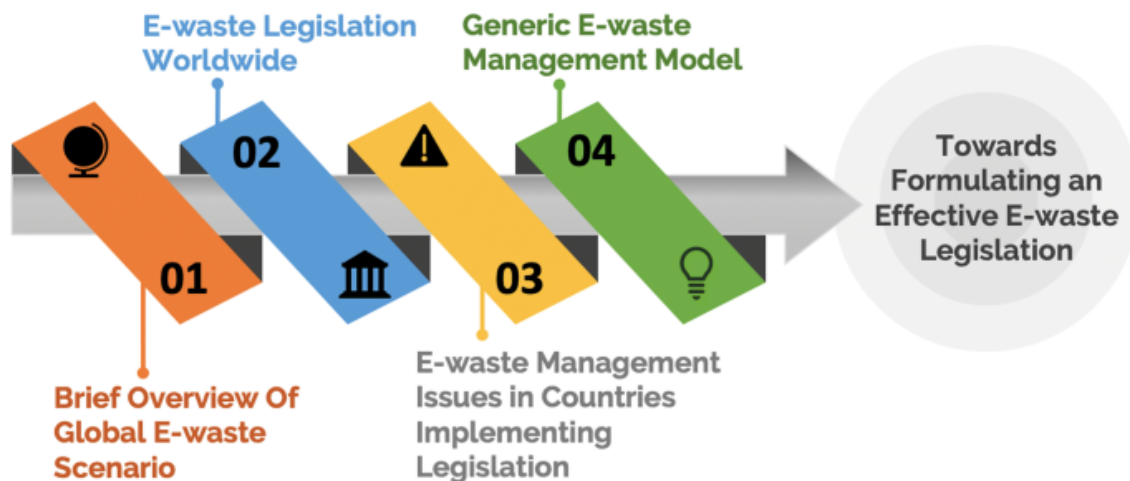
Legislation on e-waste



Currently, around 67 countries have enacted laws to manage the e-waste they generate, many of which are based on the principle of Extended Producer Responsibility (EPR). Under EPR schemes, a small charge is typically added to the price of new electronic devices to help fund the collection and recycling of older ones. These regulations now apply to regions covering roughly two-thirds of the global population.

However, a significant number of countries still lack national legislation to manage e-waste. Internationally, the movement of e-waste across borders—especially shipments to developing countries—is meant to be governed by the Basel Convention, which oversees the transboundary transport and disposal of hazardous waste. This agreement has been ratified by 188 countries, and some regions have also adopted complementary treaties.

Despite these frameworks, illegal shipments of e-waste remain widespread. Enforcement is inconsistent, and the overall system is complicated by a patchwork of national laws and varying interpretations, making it difficult to effectively regulate and track the global flow of electronic waste.



Illegal WEEE exports

The European Union has implemented regulations to ensure that Waste Electrical and Electronic Equipment (WEEE) is managed and disposed of in an environmentally sound manner. However, the illegal export of WEEE from Europe to developing countries remains a persistent problem, posing serious risks to both human health and the environment.

Several factors contribute to this ongoing issue. In some EU Member States, gaps or weaknesses in enforcement allow illegal shipments to slip through the cracks. Financial motives also play a role—exporting e-waste to countries with lower disposal costs can be more profitable than following legal recycling procedures. Additionally, limited awareness among consumers and businesses about the dangers of improper disposal contributes to the problem. Corruption in both exporting and receiving countries may also facilitate the unlawful movement of e-waste.

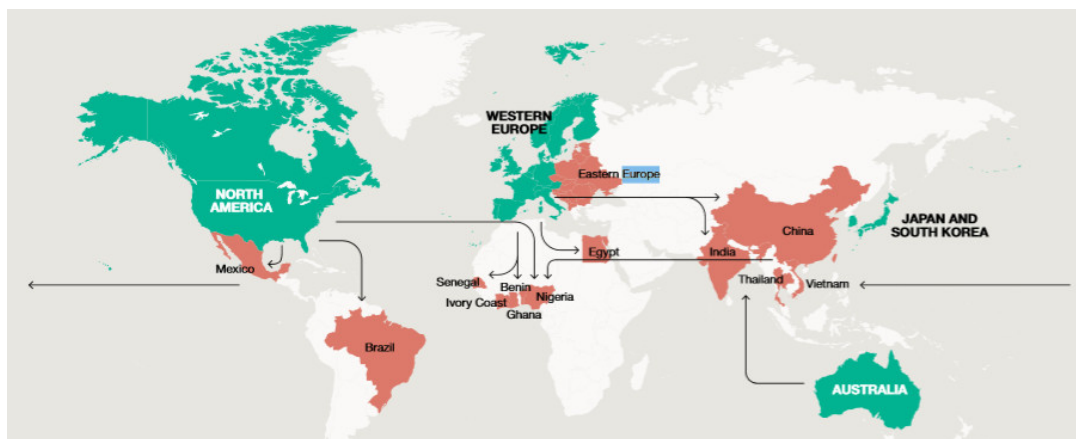
The impact of these illegal exports is far-reaching. Improperly handled e-waste can leach hazardous substances into the soil and water, damaging ecosystems and contaminating local food and water supplies. These environmental effects translate into serious health risks for communities living near informal dumpsites. Economically, these communities are often left to shoulder the costs of environmental damage and cleanup, hindering local





development. Moreover, the illegal trade in e-waste undermines legitimate waste management systems and fuels corruption.

Addressing this issue requires a coordinated, multi-stakeholder approach. Governments, manufacturers, consumers, and law enforcement agencies must work together to strengthen oversight, raise public awareness, and ensure WEEE is collected and treated through formal, certified channels. By doing so, the environmental and social damage caused by illegal e-waste exports can be substantially reduced.



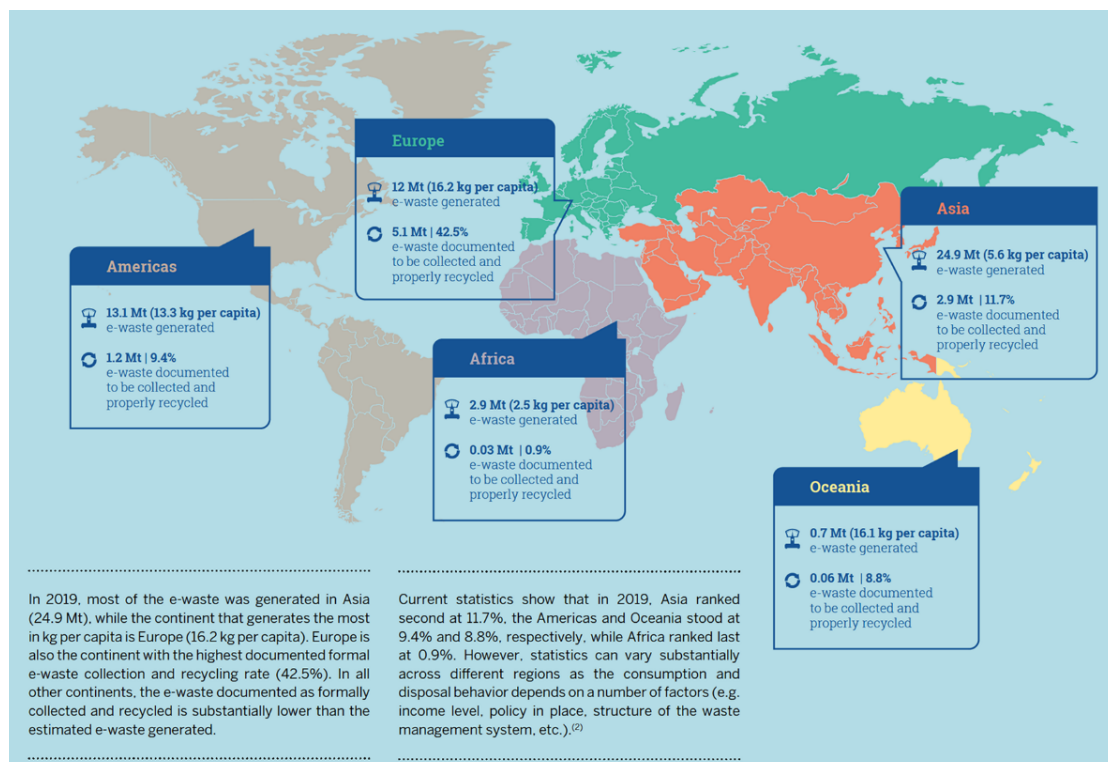
Mapping out e-waste. Source: "A New Circular Vision for Electronics - Time for a Global Reboot"
<https://www.weforum.org/publications/a-new-circular-vision-for-electronics-time-for-a-global-reboot/>



12. POLICY BEST SAMPLES ON WEEE MANAGEMENT

12.1. Policy samples for increasing collection

In the era of rapid technological advancement, electronic waste, or Waste Electrical and Electronic Equipment (WEEE), has become a growing concern worldwide. WEEE management is crucial not only for environmental sustainability but also for human health and economic growth.



One of the best practices in WEEE management is increasing public awareness. It is essential to educate individuals about the importance of proper disposal and recycling of electronic waste, the potential hazards associated with improper handling, and the benefits of participating in WEEE management programs. This awareness can drive responsible consumer behaviour, promote recycling, and ultimately contribute to a more sustainable and healthier planet.

There are many small and big companies all around the world that participate actively in extending the awareness about the proper treatment of WEEE. But in this section, it will be treated only the ones that are startup that has significantly grown this last year until becoming a unicorn, where a couple of examples can be found.

Best practice 1: WEEE Ireland Public Collection Day Events. IRELAND

Introduction

WEEE Ireland is a not-for-profit organisation, committed to delivering cost effective compliance on behalf of our Producer Members.

WEEE Ireland represents 96% of the Irish battery industry and 74% of the household electrical and electronic industry who have a Producer responsibility under EU Battery Directive 2006/66/EC & WEEE Directive 2012/19/EU to organise and finance the environmental management of their products at their end of life.



WEEE Ireland has been operational since 2005 and has been the Scheme of choice in Ireland maintaining majority market share across all sectors. WEEE Ireland operates under the approval of the Minister for the Environment, Climate and Communications.

Working closely with their partners in Local Authority and Community Recycling Groups in each location, WEEE Ireland collected 835 tonnes of WEEE in 2019. Public local collection events were promoted locally through press, radio, PR, social media and local community networks. This targeted promotion of WEEE Ireland Public Collection Day Events supported annual increase efficiencies of operations to yield clear and positive results – increase 17% compared to 2018.

Local Authority civic amenity centres, a network of participating electrical retailers and WEEE Ireland free e-waste collection days across 2022 offered a golden opportunity to end the scourge of binning and the terrible loss of valuable materials in our end-of-life electrical goods.

This year one of these events was held in Galway. Galway householders are being urged to bring their batteries, electrical, and electronic waste to a free collection day to help the county meet national e-waste recycling targets for 2023.

The event, hosted by WEEE Ireland in partnership with University of Galway, kicks off on Thursday September 21 at University of Galway. All household items with a plug, battery or cable will be accepted free of charge, including old washing machines, TVs, toasters and kettles, electronic tools and toys, cables, IT equipment, mobile phones, remote controls, batteries, including farm fence batteries, and even watches.



WEEE Free Public Recycling Events in Offaly

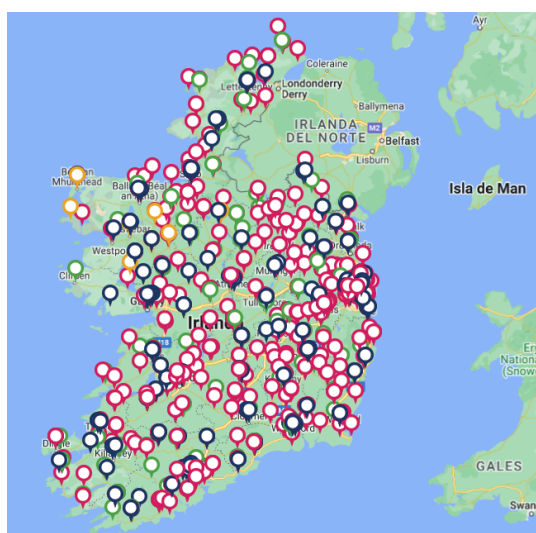
Key factors

WEEE Ireland presented their Scheme as a best-in-class Case Study at the European Commission's Compliance Promotion exercises in Dublin and Brussels. In addition, during this time they have:

- Grown the Membership numbers by another 30% to more than 1300 Producers



- Continued to increase and maintain dominant market share
- Provided EPR support for new technologies across WEEE and Battery Sectors
- Delivered additional collection programmes to meet additional takeback challenges
- Diverted over 225,000 tonnes of waste for recycling and recovery during this time
- Partnered with indigenous Irish treatment operators to support national recycling and recovery infrastructure to EN 50625 standard.
- Supported the development of new circular economy, WEEE and Battery policy and regulatory frameworks in Ireland and Europe through engagement, submissions, and expert opinion.
- Extended their compliance services through links with the pan European WEEE Europe platform and the EUCOBAT and WEEE Forum Centres of Excellence
- Led the WEEE and Battery EPR sectors in Ireland in new R&D and CE innovation programmes through co-funding and partnership with EPA Strive and CIRCULÉIRE
- Contributed over €250,000 in corporate sponsorship (over €500,000 in the last decade), to LauraLynn Children's Charity, encouraging more people to collect batteries and small WEEE for recycling.
- Promoted the WEEE and Battery takeback and environmental management messages through a comprehensive Communications Programme with far-reaching campaigns
- Launched their new Circular Vision strategy in anticipation of the Whole of Government CE Strategic focus and the next phase of Scheme Approval from 2022.



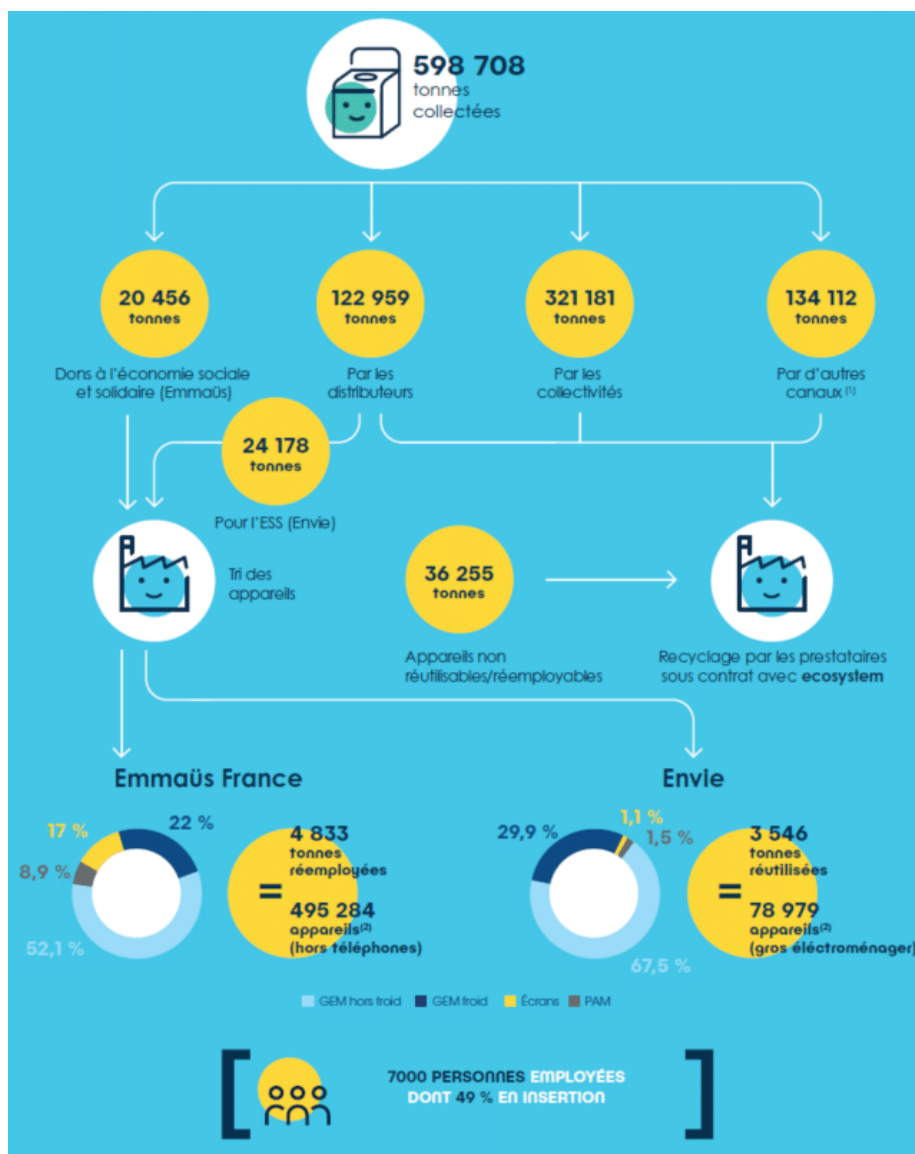
Best practice 2: Emmaüs events. FRANCE

Introduction

Emmaüs was born 73 years ago to find, with people who are victims of exclusion, solutions that allow them to once again become active participants in their lives. Faithful



to the wishes of Abbé Pierre, Emmaüs has become both a factory of social innovations and solidarity to help people in very precarious situations, and a committed and militant front in favor of a more humane and more just.



The PRO ecosystem and Emmaüs jointly organize regular neighbourhood solidarity collection events on the street to facilitate donation of old appliances. Emmaüs trucks are also present to welcome donors during the PROs solidarity collections. Emmaüs collects donations from individuals made during these events. WEEE appliances are sorted, cleaned, repaired and resold at solidarity prices by Emmaüs or, failing that, decontaminated and recycled in strict compliance with environmental standards.

Even when the donated devices cannot be repaired, Emmaüs receives financial compensation from ecosystem for its participation in the collection of used devices. The money collected by Emmaüs from the resale of old devices promotes employment and professional integration, accommodation and the fight against poor housing, as well as the fight against over-indebtedness. Ecosystem organised around 450 events every year.





Key factors

Emmaus started off in France in 1949 and the movement now has 220 member groups in the country. There are many different types of structures in France, providing a response tailored to the local situation (communities, social action and housing structures, SOS Families, friends committees and reintegration structures). The groups in the country benefit from the support of the national organisation, Emmaus France.

Main activities:

- Welcome, providing accommodation, reintegration
- Collecting, reusing, recycling and selling on objects
- Political campaigning and awareness raising
- Social action and housing (emergency accommodation, social housing, fighting against excessive debt, etc.)
- Local, european and international solidarity initiatives

Key numbers

- 30,000 stakeholders involved with Emmaus (including companions, volunteers and employees)
- 480 sales areas
- 270,000 tons of merchandise collected every year





Map of places to donate high tech and small objects

Best practice 3: The Wecycle Premium Pick-up Partners. NETHERLANDS

Introduction

The Wecycle Premium Pick-up Partners provide a pick-up service for small appliances in the Netherlands. When a new large electrical appliance is delivered, users can also return old small appliances to the delivery person. This service has been set up between Wecycle, the main PRO, and EEE sellers and their logistic service providers.

At Wecycle Premium Pick-up drop-off points, consumers can bring not only the old appliance, such as a washing machine or refrigerator, but also smaller electrical appliances, such as a hair dryer, drill, laptop, mobile phone, desk lamp or TV.

With the Jekko, the practical collection box for the home, consumers can store used electrical appliances (and also batteries and light bulbs) neatly in a central location and then hand them in.

Key factors

The OPEN Foundation fulfills the legal producer responsibility for e-waste. Under the name Wecycle they run campaigns to stimulate the collection and recycling of e-waste. They do this by increasing knowledge of the Dutch and strengthening "recycling" self-confidence.

In 2022, the OPEN Foundation has collected a total of 159 million kilos of e-waste in collaboration with our chain partners. In addition, more than 11 million kilos were offered to certified processors via metal recyclers: 2% more than last year; a good start to our effort to minimize the most important 'leakage flow' of e-waste. In addition, they continue to focus on extending the lifespan of equipment, parts and materials: the longer they stay on the R-ladder, the more electrical waste we keep out of leakage currents.

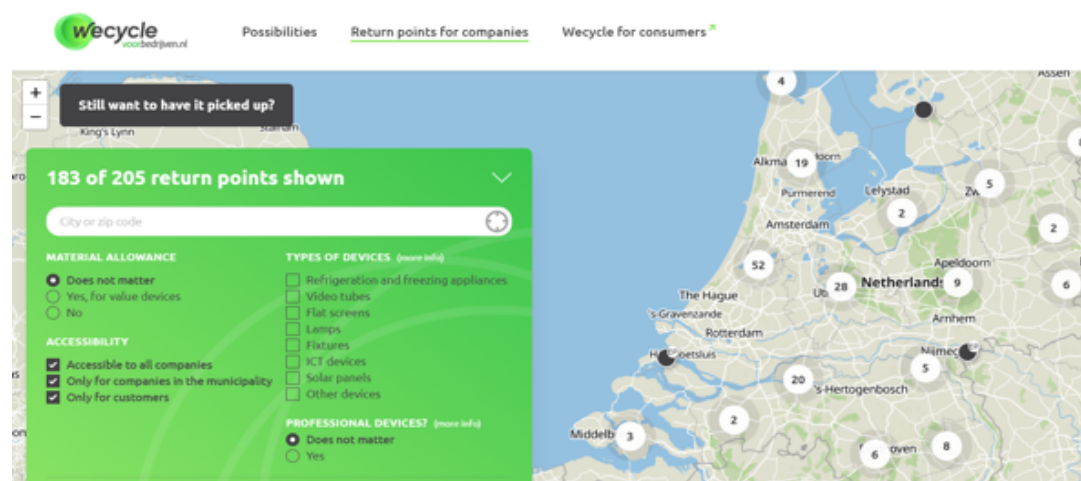
They collect waste electrical and electronic equipment together with their partners at more than 15,000 service points, including almost 8,000 Wecycle return points. Think of recycling centers at municipalities, petting zoos, retailers and technical wholesalers. Consumers already know where to find the Wecycle points in Netherlands.



The percentage of e-waste that ends up in the wheelie bin is decreasing. Nevertheless, they continue to focus on higher collection, more repairs, reuse and sales (other rungs on the R ladder) and responsible processing of discarded equipment, materials and raw materials. Every device counts.

To encourage collection from the municipality as well, they developed a benchmark for recycling centers in 2022 in which they map out how much e-waste is collected per municipality and how much CO2 they have saved as a result.

Moreover, in 2022 they laid the foundation for Wecycle for companies, an online platform that was officially launched in early 2023. As a company, club or foundation, it can be seen here where you can dispose of all kinds of electrical waste: from lamps and flat screens to solar panels and ICT equipment. You will also find indications on wecyclevoorbedrijven.nl whether you can expect compensation for your electrical waste. In this way we contribute to a responsible way of collecting and processing equipment from the business community.



wecyclevoorbedrijven.nl

Best practice 4: Ecolight Consortium. ITALY

Introduction

Ecolight is a qualified partner of companies, institutions, independent contractors and Organised Large-scale Distributions for the integrated management of a company's waste. This Italian company has launched new smart bins dedicated to the collection of small WEEE that meet the requirements of Italian Decree Uno contro Zero (Italian for "one against zero").

Ecolight has made environmental protection and compliance with the regulations its cornerstones: it operates with an authorised logistics network and certified facilities for waste treatment that guarantee high-level standards of recovery.



IL 2023 IN BREVE



2.402 Aziende coinvolte



46.783 Tonnellate rifiuti gestiti



18.605 Tonnellate RAEE gestiti



45.997 Missioni erogate



94,6% Tasso medio recupero RAEE

Data from Social Report 2023

Key factors

The Ecolight Consortium in Italy has launched new smart bins designed for distribution and commercial spaces. RAEE Ecolsoles (Italian for “WEEE Eco-islands”) are smart bins dedicated to the collection of small WEEE that meet the requirements of Italian Decree Uno contro Zero (Italian for “one against zero”).

The small size of the container (1.5 x 1.2 x 1.5 metres) and its complete automation have made it an innovative tool for the collection of small electronic waste (e.g. mobile phones, small household appliances, light bulbs and energy saving lamps). The WEEE eco-islands are located in urban environments close to large shopping centres to easily reach the citizens.

The operation of the eco-islands involves the registration of the consumer (through the regional health card), the identification of the type of waste to be thrown away and the separate disposal according to the same type. At the end of the operations, the machine will issue a receipt confirming that the waste has been delivered. Through a monitoring system, when the internal containers are full, the machine alerts the technicians by text message to come and empty them. The waste delivered is then tracked from the point of delivery until treatment and recovery. To date, there are still 30 functioning WEEE eco-islands located in the regions of Emilia Romagna, Veneto, Lazio, Lombardia and Toscana.

Best practice 5: Helsinki Metropolitan Area Recycling Centre (Kierratyskeskus). FINLAND

Introduction





The Helsinki Metropolitan Area Recycling Centre (Kierratyskeskus) is a non-profit company founded in 1990 with the purpose of reducing resource consumption, increasing environmental awareness and creating opportunities for civic participation and employment.

Citizens, companies and institutions can hand in small EEE (including laptops and chargers) in any of Kierratyskeskus' recycling centres. Kierratyskeskus also has a pick-up service for a small fee. Once or twice a year, the organisation plans a collection tour with 30 stops around the metropolitan area to make it easy for citizens to hand over their EEE.

Key factors

The EEE is transferred to a pre-sorting centre where resale potential is assessed. If it is economically reasonable, the EEE is repaired in one of the Centre's four repair shops. Not all of the recycling centres have a repair shop, so EEE collected at centres without a repair shop are transferred to another centre for assessment. The repair shops differ in size. The Re-use Centre is planning on cutting the number of repair shops to two for better efficiency. The EEE that cannot be resold is sent to the SERTY EPR scheme for recycling.



Pick-up service and household company pick-up

Order an affordable pick-up service at a time that suits you online or by phone. Don't forget the convenient house company pick-up as well!

[Read more about the pickup service](#)



Donating in stores

You can bring intact, clean and reusable donations of goods to all Recycling Centers within the opening hours. You can also bring electrical equipment and bicycles with accessories in broken condition.

[Find your nearest store](#)



Collector cars

There are many types of collector cars; some are on duty in Töölö and Hagisse, some are probably just around your corner of the house.

[Read more about collector cars](#)

The recycling center's donation points 1



**Box donation points**

The boxes can be used to donate extra household items in good condition.

[Find the nearest Box](#)
**Cello donation point**

You can find the recycling center's donation points at Sello's parking level, near the bottle return connection.

[Read more about Sello's donation points](#)
**MyFetch service**

With MyFetch, you can recycle clean and undamaged household items, clothes and textiles that are suitable as they are.

[Read more](#)

The recycling center's donation points 2

Best practice 6: Ö3-Wundertüte. AUSTRIA

Introduction

Ö3 Wundertüte (AT) is a yearly campaign implemented by the NGO Caritas and the Ö3 radio²⁹ in 2005 to mail mobile phones to a charity for re-use or recycling. Paper bags are sent to households throughout Austria and consumers can send back used mobile phones with accessories free of charge at the post office.

The campaign achieves high collection (up to 31% of mobile phones put on the market in Austria) and re-use rates (60% of collected devices). The campaign is conducted through a partnership between a charity, a re-use organisation, a national radio and postal services.



Key factors

Around November every year, the Austrian system “Ö3-Wundertüte” sends red paper bags to households throughout Austria.



Used mobile phones can be placed with or without accessories in the Ö3-Wundertüte and handed in postage free of charge at the post office. The system cooperates with Austrian post, which is responsible for the logistics, the hit radio Ö319 which leads the communication and the social recycling business “magdas” which organises treatment.

The revenues from the sale of each donated mobile phone goes to the emergency aid fund "Licht ins Dunkel" and the emergency aid of Caritas.

Ö3-Wundertüte collects 400,000 – 500,000 mobile phones (including some chargers and other phone equipment) annually. This amount corresponds to 40 to 70 tonnes/per year. This shows a considerable potential for collection systems based on charity incentives.

Best practice 7: Jedonnemontelephone. FRANCE

Introduction

Jedonnemontelephone is a year-round mobile phone collection initiative implemented by the French PRO for WEEE.

Consumers can send their devices for free either by printing out a label to stick on an envelope or by ordering a prepaid envelope. Devices are received as products (EEE) and can therefore be assessed for re-use.



Ecosystem, the NGO behind the project, said people could order a pre-paid envelope from its website jedonnemontelephone.fr (I give my phone) or simply print out a pre-paid address label.

Key factors

The phones are sent to a processing centre where all data is erased before the phone is either refurbished for sale at Emmaus charity shops, or in the majority of cases (83 percent) broken down for recycling and the removal of the most polluting components.

The project is an expansion of the nonprofit's main electronics recycling programmes that aim to keep appliances and other devices from incinerators or landfill sites.

Best practice 8: Aiven. FINLAND

Introduction

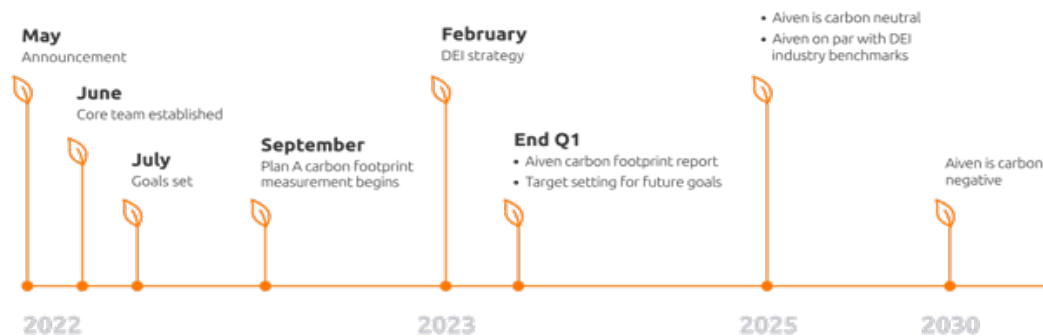
One not so well know startup that has become a unicorn in this last year is Aiven. This company offers a cloud data platform that provides fully managed open-source databases, streaming, and search applications, among other services. Founded in 2015, Aiven has become a key player in the tech industry by simplifying the process of setting up and managing cloud databases. This allows developers to focus on building applications rather than managing infrastructure.

Aiven's services are available on all major cloud platforms, including AWS, Google Cloud, and Azure. This wide availability, combined with their commitment to using open-



source technologies, has made Aiven an attractive option for many organizations looking to innovate and scale their data-intensive applications.

As a tech company, Aiven also directly contributes to Waste Electrical and Electronic Equipment (WEEE) management. The way they contribute to this matter is by promoting the importance to treat electrical and electronic devices in a special way when they reach its end of life, increasing this way the awareness of their clients. One of the activities that Aiven carry out to promote this, is through awareness campaigns for their customers and the wider public about the importance of proper e-waste management.



Moreover, by providing cloud-based services, Aiven helps reduce the demand for physical hardware, which in turn can lead to a reduction in electronic waste. Cloud-based services allow for better utilization of hardware resources, which can reduce the need for new devices and prolong the lifespan of existing ones.

Key factors

Aiven offers data infrastructure elements as a service. They don't sell licenses, and they don't own servers - they manage people's data infrastructure for them.

Data infrastructure refers to all the pieces in a company's IT system dealing with data. It can include:

- Databases for storing information
- Data brokers for passing data to and from other systems
- Visualization solutions
- Analysis solutions
- Monitoring and metrics solutions
- Search engines
- Cache
- Connectors for integrating into other systems

By using open-source software (OSS), they and their customers make sure that they never get locked up in a vendor relationship.



Open source has many other benefits, too. The development happens out in the open, which means the bar of access is low, and the tools themselves are available for anyone who needs them.

The developer base is huge and global, and there are always many eyes on any piece of code. As a result, security and reliability is better in the open-source world than for proprietary software.

12.2. Policy samples for recycling, up-cycling, repairing and second life

Best practice 1: Refurb. DENMARK

Introduction

Refurb is a Danish company that acquires used functional IT (including laptops and tablets) from large companies (more than 200 employees) and public institutions. Refurb refurbishes, upgrades and cleans the EEE as required, and sells it again on the same terms of guarantee as new products.

Refurb's collection methods differ depending on the quality and condition of the used EEE or the need of the company/institution. In some cases, the company/institution has a permanent container where the used EEE can be placed. In other cases, the used EEE is packed in boxes.



Some companies/institutions transport their used EEE to Refurb and in other cases Refurb packs the used EEE at the company/institution. Refurb also sends cages out to companies in order to transport their IT in. Defective EEE is always collected in cages. When the used EEE arrives at Refurb the first step is to delete data from all data-bearing devices. Then they then assess the need for repairs. If it is profitable, they repair the device - if not, they take out useful spare parts and shred the rest.

Refurb has their own shredder, and materials from the shredder are sorted into 17 different fractions. The metal is then sold to a recycling company for recovery. If some products are still functional but not new enough to have any market value in Denmark, they are sold in other countries. Approximately 80% of the used laptops are sold in Denmark and 20% are sold to foreign markets.

Key factors

A Refurb product has gone through a series of specialized and certified processes before it lands in the hands of a new owner.

The processes involve thorough inspection, certified data erasure, testing and upgrading software to ensure the highest quality.

- 1) Certified data erasure. Data erasure requires professional skills. All previous data is deleted according to strict international standards and only with proven algorithms and recognized deletion software. You will experience the first start-up of your Refurb product exactly like a new purchase. Without it being one.



- 2) Test and grading. A Refurb product has been thoroughly tested by experts. All products are refurbished, upgraded, and installed with the latest software to work exactly like new products. The condition of the product is assessed and thoroughly cleaned inside and out.
- 3) Quality. The Refurb product is a quality product whose lifespan can and must be extended. It must meet strict quality requirements. This means that the Refurb product, with proper maintenance, has an expected lifespan of at least 2-4 more years with you as the new owner.
- 4) Warranty. Even if a Refurb product has been used before, the warranty is renewed after going through the refurbishment process. It's guaranteed with a 2-year warranty.
- 5) Result. A Refurb purchase is a better alternative to a new purchase. It is saved money on quality products that are also better for the environment.

A Refurb product uses an average of 300 kg less CO₂, 1.5 tonnes less water and 21 kg less chemicals compared to new models.

Best practice 2: RefugeePhones. SWEDEN

Introduction

Refugee Phones is an initiative that encourages people and organisations to donate their old smartphones to refugees and migrants.

It has delivered more than 6,000 smartphones since its launch in Sweden a year ago - and is in the middle of a big push ahead of the planned demolition of the "Jungle" refugee camp in Calais.

RefugeePhones distributed thousands of pre-paid cards and mobile phones to refugees between 2015 and 2017. Their business was based on donations from mobile phone manufacturers and private individuals and on extensive collaboration with telecom operators. Sony Mobile, for example, has directly donated handsets to the initiative in Sweden, while telecoms companies Telia and 3 have both donated SIM cards.

Coordinated from the UK, another group, Phone Credit for Refugees, enables individual donors to pay directly for credit for refugees who need it.



Key factors



After checking the functionality of devices, data contained on the phones was deleted and the donated phones were reconfigured. The charity had an order system online, where refugees could fill out an application form. Only high-quality phones were donated for re-use; lesser-quality phones were sold to an EPR scheme for recycling.

Best practice 3: Apple. EEUU

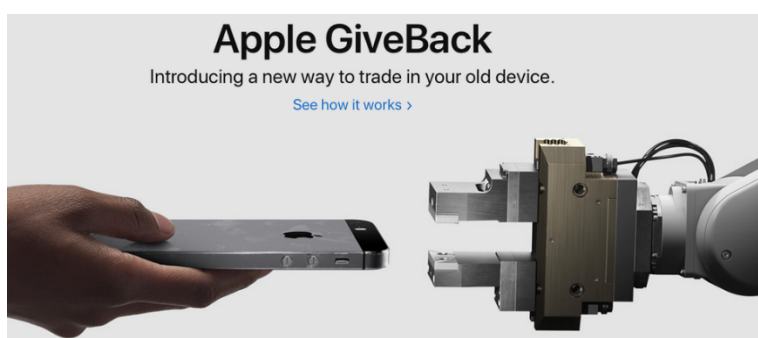
Introduction

Apple is running a trade-in system for their devices (iPhone, iPad, Apple Watch, Mac, accessories, non-brand devices etc.). Apple offers product take-back and allows customers to hand in used devices online or in Apple stores.

Key factors

To ensure data privacy, the latest owner must delete the data on the device before trade-in. To estimate the remaining value of a device, the customers must answer a set of questions online, whereas the devices handed in in Apple stores are evaluated by retail specialists.

Depending on the condition and the model type, a monetary value is calculated and paid out to the customer as a gift card or amount towards the purchase of a new device. Apple's trade-in process is part of the buy-flow process, but customers can also simply return an old device without a new purchase. Devices with a remaining value are transferred to re-use/refurbishment activities whereas those without value are sent to recycling.



Apple has partnerships with trade-in vendors which organise the refurbishment and reselling process through existing channels. In select countries, iPhones directed to recycling can be dismantled by Apple's robot "Daisy". The materials obtained may be sold to specialised recycling companies.

All devices are tracked until the end of the recovery process. In 2019, 11.1 million devices were taken-back by Apple in the USA, with the number of devices sent to re-use/refurbishment greatly exceeding the number of devices directed to recycling. In 2018, for example, more than 7.8 million Apple devices got refurbished.





Good for the planet.

If your device is in good shape, we'll help get it to a new owner. Or, if it's seen better days, we can recycle it for free.

[Recycle your device](#)[More ways to recycle](#)

Doing more, using less. We're using more recycled content in our products than ever before. And we're recovering crucial materials from end-of-life devices to use again in new ones.

[Learn more](#)

For a better future. Our plan is to have a net zero carbon impact by 2030. We're investing in low-carbon design, energy efficiency, renewable power, and more.

[See just how far we go >](#)

Best practice 4: Fairphone. NETHERLANDS

Introduction

Fairphone is a social enterprise that develops and produces smartphones (so called Fairphones) in a way that contributes to a fairer production and a more transparent supply chain. Thanks to the modular design of their phones, Fairphone's aim is to allow easy exchange and repair of phone parts to increase the lifetime of the whole device. Several materials in different parts of the phone originate from recycled sources.

FAIRPHONE

Since 2017, Fairphone takes back all types of smartphones (not only Fairphones) in France and Germany. In 2020, Fairphone collected around 17,000 phones from the European market which represents 18% of Fairphone's sales. Phones and batteries from African countries were also shipped back to Europe through a recycling initiative Fairphone supports.

Apart from increasing the collection awareness in the field relative to WEEE management, another technique with an equally impacting result is the second-life solution. This technique consists of recycle and reuse electrical and electronic waste through reconditioning.

Key factors

In March 2021, Fairphone launched a new Recycling Service to increase its collection rate. With this new service, customers sending in an old phone are offered a discount on a new Fairphone or a direct cash back.

Phones without remaining value are not refunded but can be sent in free of charge for recycling purposes. Customers can download a shipment label from the Fairphone website for free.





All phones are directly sent to Fairephone's French repair and recycling partner. The partner checks if any of the phones is black-listed (e.g. was stolen) and assigns a value to every phone. The value of the phone is calculated on the basis of its actual price on the second-hand market.

Customers receive their refund as soon as the phone has been reviewed. Phones in good condition are refurbished and resold on the (online) second-hand market whereas others are directed to a recycling company. In 2020, 40% of all phones collected could be re-used and 60% were recycled. Spare parts are also sourced from phones and are used internally by the repair and recycling partner.

Since 2020, Fairphone also offers a service to trade-in single parts (e.g. when a consumer upgrades a Fairphone 3 to a Fairphone 3+ with new parts). The parts are also repaired or recycled. Fairphone's overall goal is to implement a collection and re-use/recycling system that is scalable. Fairphone would like other (phone) companies to take over their concept and to take-back all types of phones irrespectively of their market value. Fairphone is also thinking about taking back other small EEE (e.g. tablets). The company aims to offer its Recycling Service in all European countries.

Best practice 5: Back Market. FRANCE

Introduction

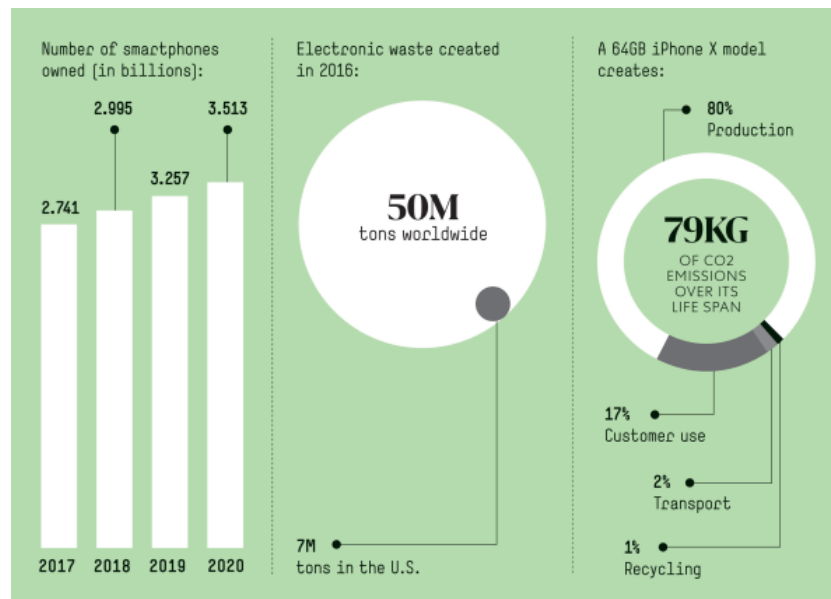
This startup was founded on August 2014, and is an online marketplace that sells refurbished electronic devices.

Back Market has become world changing example due to its innovative approach to the electronics market, providing consumers with an alternative to buying new devices, which can be expensive.

Key factors

By offering refurbished devices, Back Market allows consumers to purchase high-quality electronics at a lower cost. This approach not only benefits consumers but also helps to reduce electronic waste and the demand for new devices, contributing to environmental sustainability. This approach aligns with the principles of the WEEE directive, which encourages the proper disposal of electronic waste and the reduction of wasteful consumption of natural resources.





By offering refurbished devices, this unicorn company extends the life cycle of electronic products, thereby reducing the amount of electronic waste that ends up in landfills. This not only helps to conserve natural resources but also reduces the demand for new devices, which in turn decreases the amount of waste generated.

Furthermore, Back Market's rigorous vetting process for sellers ensures that all refurbished devices sold on their platform have been properly restored and tested. This guarantees that these devices are of high quality and can continue to be used for a long time, further contributing to the reduction of electronic waste.

In addition to the practices mentioned above, one of the most significant ways Back Market contributes to WEEE management is through increasing awareness among its clients. By educating consumers about the benefits of buying refurbished devices, Back Market not only promotes its own business but also raises awareness about the importance of reducing electronic waste.

Through their platform, they inform customers about the environmental impact of electronic waste and how purchasing refurbished devices can help mitigate this. They also provide information on how refurbished devices are a cost-effective and environmentally friendly alternative to buying new.

Back Market has also an extensive guide on how people can properly dispose of their electronic devices once they've reached the end of their life cycle, further promoting responsible e-waste management.

This educational approach empowers consumers to make informed decisions that benefit both their wallets and the environment.





In essence, Back Market is not just selling refurbished electronics; they're also selling the idea of a more sustainable and responsible way of consuming electronics. This approach has a ripple effect, as every informed customer can influence others, leading to a broader societal shift towards more sustainable consumption habits.

Best practice 6: Revolut. ENGLAND

Introduction

This corporation is a British financial technology company that was founded on July 1, 2015, and offers a range of digital banking services.

The services provided by Revolut include easy money management, all in one app. Revolut has become important due to its innovative approach to banking, and thanks to that it has grown significantly until becoming the most profitable unicorn in Europe this last year.

As of 2023, Revolut has attracted more than 18 million customers worldwide. It has been referred to as a "tech superstar" and is considered one of the fastest-growing digital banks with the widest range of features.

Revolut

But Revolut is not only a profitable startup but has also developed a program where it invests part of the budget in WEEE management through promoting the reuse of electronic and electrical devices.

The way that this is promoted is possible thanks to the donations and refurbishment of any redundant electronic equipment when it reaches its end-of-life, and if it cannot be refurbished or reused, Revolut rely on the services of a trusted global partner to recycle e-waste and ensure none of it is directed to landfill.

Key factors

Revolut has taken a number of steps to reduce our carbon footprint:

- Clear waste management procedures allowing for sorting and recycling of general waste across locations.





- Strict e-waste management (meaning discarded electrical and electronic technologies)
- They've introduced a sustainable business travel policy to reduce and compensate emissions linked to such travel.
- Energy used at our London and Vilnius offices is from 100% renewable sources. They expect our policy to expand to other areas as they grow.
- They closed one floor of their London head office to reduce energy consumption.
- All United Kingdom employees also have access to the Cycle to Work scheme to encourage the use of environmentally friendly transport.

Best practice 7: Bolt, ESTONIA

Introduction

Another recent unicorn that has contributed greatly to the cause of WEEE management is Bolt. This Estonian mobility company was founded in August 2013 and offers a variety of services including ride-hailing, micro mobility rental, food, and grocery delivery, and car-sharing.

Bolt operates in over 500 cities in more than 45 countries in Europe, Africa, Western Asia, and Latin America. The company has more than 150 million customers and more than 3 million driver and courier partners.



Bolt has become important due to its innovative approach to mobility. It is the first European mobility super-app offering better alternatives for every purpose a private car. This has made it a top choice for those who prefer to access most services through their smartphones.

Furthermore, this enterprise is also committed to sustainability and compensates for the CO2 emissions its transport and delivery solutions create, minimizing its impact on the local environment. Bolt is one of the few mobility companies that offsets the carbon emissions of all its rides globally. They do this by investing in projects that reduce the amount of carbon dioxide in the atmosphere, making all Bolt rides 100% carbon-neutral.

Key factors

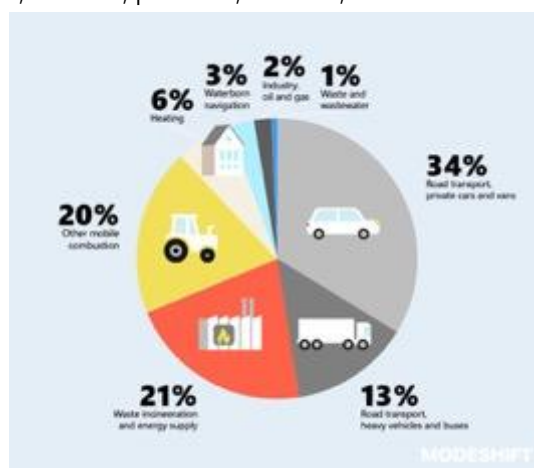
One of the projects where a certain percentage of the budget goes is to Bolt's e-scooters. This program consists in recycling the electric scooters that are at the end of the life cycle thus managing to reduce waste from hardware, thereby embedding circular economy principles across the scooter operations. That is the main reason why they're using, reusing, maintaining, and repairing resources wherever possible to reduce waste and the need for new raw materials through a robust recycling system.



Bolt has also embedded circular economy principles across the entire lifecycle of their products and services. Wherever possible, they use, reuse, maintain, and repair resources to reduce waste and the need for new raw materials.

Thanks to these policies, this startup has managed to achieve 92% reuse of electronic and electrical components in its fleet of electric scooters. The other 8% consists of the batteries of these electric vehicles, which are recycled safely through robust partnerships with local providers.

Bolt is also doing its part to help the city of Oslo reach its sustainability goals being an active member of Næring for Klima, a climate collaboration between Oslo municipality and businesses. One of these goals is to reduce greenhouse gas emissions in the city by 95% by 2030. To enable responsible waste management, Bolt partnered with the company RENAS, which has a network of its partners to handle various aspects of the process. Battkomp (formerly known as Yedlik) inspects and repairs scooter batteries within this network. And Norsk Gjenvinning recycles many remaining scooters waste materials, including wood, metals, plastics, rubber, and others.



Best practice 8: Voi. SWEDEN

This mobility company was founded in 2018 and offers electric scooter sharing service. The company operates in several cities across Europe, providing an eco-friendly transportation alternative to traditional vehicles. Users can rent Voi's electric scooters through a mobile app, making it a convenient option for short distance travel.

Voi has become important due to its innovative approach to urban mobility.

It provides a solution to the “last mile” problem in transportation, which refers to the challenge of traveling the final stretch from a transportation hub to a final destination. By offering a convenient and eco-friendly transportation option, Voi helps to reduce traffic congestion and carbon emissions in cities, gaining great popularity among those people who want to contribute to reducing pollution.





Key factors

Voi, as a provider of electric scooters, falls under the category of producers of electrical and electronic equipment. As such, it has responsibilities under the Waste Electrical and Electronic Equipment (WEEE) regulations. These responsibilities include ensuring the correct disposal and treatment of their products when consumers dispose of them.

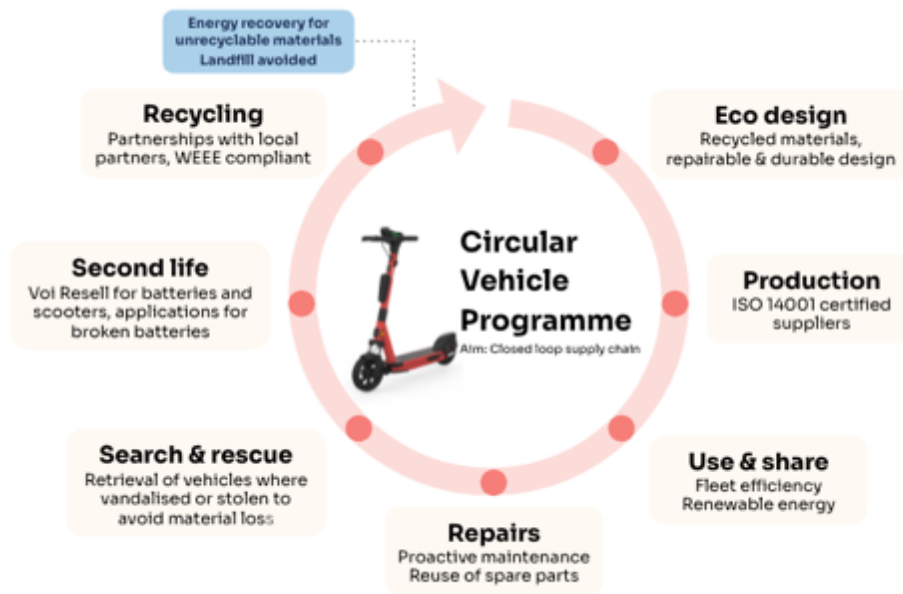
Voi contributes to this matter in several ways. Firstly, they have built a hierarchy of waste to consider its importance at every stage of our supply chain. From predicting potential for waste during the design stage, to managing waste in the warehouses as well at the point of disposal. There are four main steps that are taken at Voi to ensure best-in-class recycling processes:

- Optimise the use of recycled and recyclable materials in the vehicles.
- Repair and reuse spare parts.
- Implement industry-leading recycling processes.
- Establish zero-waste warehouses in all markets.

However, for the fraction of materials that cannot be reused, Voi strives to divert all waste from landfill and recycle and recirculate all materials elsewhere, by collaborating with local recycling experts.

Voi has also developed an eco e-scooter with a design where 91% of the materials that are used to build it can be recycled. With this, Voi has managed to carry out a circular approach where each scooter in their fleet can be used to build another one when it reaches the end of life.





Furthermore, in addition to all the supply chain recycling and circularity practices, Voi is also focusing on the eradication of all electronic and electrical waste at warehouses, and they aim to have zero-waste warehouses by 2024.





13. INDICATORS BENCHMARKING AND CONVERGING MEDITERRANEAN POLICY

13.1. KPIs to be achieved

According to the aim of the eWAsTER project it is important to set the KPIs, measuring success of the project and impact on the market and its regulation. Among the KPIs possible to watch can be:

1. Increased WEEE collection rates measured as a percentage increase in the amount of e-waste collected within participating regions over a set period.
2. Enhanced WEEE reuse and refurbishment rates by measuring the percentage of collected e-waste that is successfully reused or refurbished instead of being directly recycled.
3. Improved WEEE recycling efficiency through monitoring the percentage of collected e-waste that undergoes proper and efficient recycling processes, minimizing waste and maximizing resource recovery.
4. Policy alignment with the EU Circular Economy Action Plan using qualitative assessment of how well the policies developed or refined through the project align with the principles and goals outlined in the Action Plan.
5. Knowledge sharing and collaboration among participating regions measured by tracking the number of knowledge exchange events, best practice documents shared, or collaborative policy development initiatives undertaken by the regions.
6. Public awareness and participation, bringing the changes in public awareness of ewaste issues, monitor participation in e-waste collection programs, or engagement in initiatives promoting responsible e-waste management.

Measuring the Key Performance Indicators (KPIs) within the eWAsTER project will require a clearly defined methodology for data collection and analysis. Below is the proposed methodology for measuring each KPI.

In detail, within work package 2 of the project, Marche Region will be in charge of carrying out the pilot called WEEE REUSE, which promotes the creation of new business models for reuse of plastic and e-waste, with a focus on creating jobs for vulnerable individuals.

The KPIs that have been agreed upon to reach the objective are the following:

Job Creation & Impact on Vulnerable Individuals:

- Number of Jobs Created: Track the total number of jobs created within the pilot program related to plastic and e-waste reuse. Target: Create X number of jobs.
- Number of Vulnerable Individuals Employed: Specifically track the number of jobs filled by individuals from vulnerable groups (e.g., long-term unemployed, people with disabilities, refugees, etc.). Target: Y% of jobs created are filled by vulnerable individuals.
- Job Retention Rate: Measure how long vulnerable individuals retain their employment within the program. Target: Achieve a job retention rate of Z% after a certain period (e.g., 6 months, 1 year).





- **Income Generated by Vulnerable Individuals:** Track the average income earned by vulnerable individuals employed in the program. Target: Ensure income meets or exceeds a living wage standard.
- **Skills Development & Training:** Measure the number of vulnerable individuals who receive training and develop new skills related to plastic and e-waste reuse, recycling, and business operations. Target: Provide training to X% of participating vulnerable individuals.
- **Improved Quality of Life (Qualitative):** Gather qualitative data (e.g., through surveys, interviews) to assess the impact of employment on the quality of life of vulnerable individuals (e.g., improved financial stability, social inclusion, self-esteem). Target: Demonstrate positive impact on quality of life through qualitative data.

Business Model Viability & Impact:

- **Number of Businesses Created:** Track the number of new businesses established as part of the pilot program focused on plastic and e-waste reuse. Target: Create A number of viable businesses.
- **Revenue Generated by Businesses:** Measure the total revenue generated by the businesses involved in the pilot. Target: Achieve a total revenue of \$B.
- **Profitability of Businesses:** Track the profitability of the participating businesses. Target: Achieve a profit margin of C% for participating businesses.
- **Volume of Plastic and E-waste Reused:** Measure the amount (in weight or units) of plastic and e-waste collected, processed, and reused through the program. Target: Reuse D tons/kg of plastic and E tons/kg of e-waste.
- **Types of Products/Services Developed:** Track the variety and innovativeness of products and services created using reused plastic and e-waste. Target: Develop F number of new and innovative products/services.
- **Market Demand for Reused Products/Services:** Assess the market demand for products and services made from recycled plastic and e-waste. Target: Achieve G% market penetration for recycled products.
- **Cost-Effectiveness of Reuse Processes:** Analyze the cost of collecting, processing, and reusing plastic and e-waste compared to traditional waste management methods. Target: Demonstrate cost-effectiveness of reuse processes.

Environmental Impact:

- **Reduction in Landfill Waste:** Estimate the amount of plastic and e-waste diverted from landfills due to the program. Target: Divert H tons/kg of waste from landfills.
- **Reduction in Greenhouse Gas Emissions:** Estimate the reduction in greenhouse gas emissions due to recycling and reuse activities. Target: Achieve I tons/kg of CO₂ equivalent emission reduction.
- **Resource Conservation:** Quantify the amount of virgin materials conserved due to the reuse of plastic and e-waste. Target: Conserve J units of virgin materials.

In addition, within work package 2 of the project, UCPB will be in charge of carrying out the pilot called WEEE BEHAVE which will implement a competition and awareness campaign at schools and city halls, presenting the idea that cooperation is required at every level of the society.

The KPIs that have been agreed upon to reach the objective are the following: School-Based Competition & Awareness Campaign





- Number of participating students: This measures the reach of the campaign within the school system.
- Number of participating schools: This shows how widespread the campaign is across the school district.
- Student engagement: This could be measured through surveys, focus groups, or observation of student participation in campaign activities.
- Changes in student attitudes and behaviors: This could be measured through pre- and post-campaign surveys or assessments of student knowledge and understanding of cooperation.
- Teacher involvement: This measures the level of support from teachers and their engagement in the campaign.
- Number of external organizations (NGOs, sponsors) supporting the campaign.

City Hall Awareness & Participation Campaign

- Number of participating city departments: This shows how many departments are involved in the campaign and committed to cooperation.
- Number of city hall employees involved: This measures the reach of the campaign within the city government.
- Changes in city hall policies and practices: This could be measured through an analysis of new policies or changes in existing ones that promote cooperation.
- Public awareness of the campaign: This could be measured through surveys or media coverage.
- Community engagement: This measures the level of participation from the wider community in campaign activities.
- Number of new policies or procedures introduced to improve cooperation between departments

Overall Campaign Impact & Long-Term Sustainability

- Number of campaign events and activities: This shows the level of activity generated by the campaign.
- Media coverage: This measures the amount of media attention the campaign receives, which can help to raise awareness and promote cooperation.
- Social media engagement: This measures the level of online interaction with the campaign, such as likes, shares, and comments.
- Partnerships: This measures the number of partnerships that are formed between schools, city hall, and other organizations as a result of the campaign.
- Sustainability: This measures the extent to which the campaign's impact continues beyond the pilot phase.

13.2. Proposals of improvements at local and regional level

Building upon the eWAsTER project's foundation, here are some potential proposals for improvements at local and regional levels to further enhance e-waste management.

Local level

- ✓ Public awareness campaigns by organizing educational workshops, community events, and targeted social media campaigns to raise awareness about responsible e-waste disposal and the availability of local collection points.
- ✓ Incentivize e-waste reuse and refurbishment through partnership with local repair shops to offer discounts or vouchers for e-waste repairs and refurbishments, thereby extending the lifespan of devices.





- ✓ Organize community collection events, hosting regular e-waste collection drives in convenient locations, making it easier for residents to responsibly dispose of their unwanted electronics.
- ✓ Implement convenient e-waste drop-off points by establishing easily accessible and clearly marked drop-off locations, such as supermarkets, recycling centres, or public buildings, to encourage regular e-waste disposal.
- ✓ Partner with local schools and businesses to establish dedicated e-waste collection points and educational programs for staff and students on responsible e-waste management.

Regional level

- ✓ Develop regional comprehensive e-waste management plans that outline specific targets, strategies, and resource allocation for improving e-waste collection, reuse, and recycling across the region.
- ✓ Invest in e-waste processing infrastructure by supporting the development or upgrade of regional e-waste processing facilities to ensure efficient and responsible recycling, minimizing environmental impact.
- ✓ Standardize e-waste collection and recycling practices, establish consistent regional guidelines for e-waste collection, sorting, and recycling processes, ensuring efficient and high-quality recycling throughout the region.
- ✓ Foster collaboration among municipalities and stakeholders, encourage collaboration between local municipalities, waste management companies, and other stakeholders to share best practices, resources, and expertise for efficient e-waste management.
- ✓ Advocate for extended producer responsibility (EPR) schemes by lobbying national or regional governments to implement or strengthen EPR policies, holding producers financially responsible for the collection and recycling of their products at end-of-life.



14. WP3 EWASTER SOLUTIONS ENDORSEMENT AND TRANSFER FRAMEWORK

14.1. Purpose of the WP3 Consolidation

UCPB

The WP3 consolidation updates the Local Action Plan by moving from the analysis phase (WP1) and pilot testing (WP2) to a phase of policy commitment. Based on the results of the WEEE BEHAVE pilot, the objective is to secure institutional endorsement to integrate school-based awareness and collection activities into local environmental policies. This step does not imply immediate implementation, but establishes a formal commitment to consider these solutions within the Union's governance framework.

MARCHE REGION

The WP3 consolidation supports the transition from analytical and pilot phases (WP1–WP2) to structured policy commitment at regional level. Building on the OWEEE PROCURE pilot, the aim is to validate a circular approach to public administration IT management, aligned with procurement rules and data protection requirements. This endorsement phase is non-implementative and focuses on establishing a policy direction and institutional framework for future adoption.

14.2. Evidence from WP2 Pilot Solutions

UCPB – WEEE BEHAVE

The WEEE BEHAVE pilot tested a school-based approach combining educational activities with competitive WEEE collection. In approximately five months, the initiative collected over 1.36 tonnes of WEEE, involving 411 pupils and activating around 400 households.

The main strength lies in the dual-channel collection model: small WEEE collected at school and bulky WEEE delivered by families to certified collection centres. This approach enabled the inclusion of large appliances, significantly increasing volumes compared to typical school-based initiatives.

Key limitations relate to the need for coordination with waste management operators and compliance with transport and certification procedures, particularly for bulky items.

The main lesson for decision-makers is that schools can act as behavioural activation hubs rather than primary collection points. Integrating educational actions with existing infrastructure allows rapid mobilisation of households and measurable improvements in WEEE collection performance.

MARCHE REGION – OWEEE PROCURE

The OWEEE PROCURE pilot focused on the management of IT equipment within public administration, assessing procurement practices and lifecycle management through the involvement of IT and administrative departments.

The main strength observed is the feasibility of integrating circular economy principles into public procurement systems, particularly through centralised frameworks (CONSIP, SUAM) and the adoption of “circular ownership” models, including reuse and donation.



The pilot also highlighted significant structural limitations: eco-leasing models proved incompatible with public accounting rules (CAPEX vs OPEX), while data security requirements impose complex and costly procedures for certified sanitisation, limiting reuse options.

The key lesson for decision-makers is that circularity in public administration should be embedded within procurement frameworks rather than relying on external business models. Policy integration through GPP criteria and institutional coordination is essential to ensure feasibility, compliance, and scalability.

14.3. Selection of Solutions for Endorsement

UCPB

The Union of Municipalities of Pian del Bruscolo endorses the **WEEE BEHAVE** solution at local level. The endorsement aims to integrate school-based awareness and collection activities into municipal environmental policies as recurring educational programmes.

This choice is justified by the strong evidence of effectiveness in activating households, improving WEEE collection rates, and achieving high cost-efficiency through behavioural change rather than infrastructure expansion.

Other solutions, such as WEEE PROCURE and WEEE REUSE, are not endorsed at this stage, as they fall outside the operational scope of UCPB, but remain relevant as complementary approaches at regional and transnational level.

MARCHE REGION

The Marche Region endorses **OWEEE PROCURE** as the primary solution at regional level, focusing on the circular management of public administration IT equipment through procurement systems. In addition, the Region will progressively integrate **WEEE BEHAVE and WEEE REUSE** principles to support the development of a coordinated stakeholder network.

The endorsement is motivated by the need to extend the lifespan of public assets, reduce disposal costs, and ensure compliance with data protection and procurement regulations.

Eco-leasing models are not endorsed, as they are currently incompatible with public sector financial frameworks, procedural requirements, and data security constraints.

14.4. Conditions for Future Adoption

UCPB

The adoption of WEEE BEHAVE requires action primarily at **the local governance level**, coordinated by the Union of Municipalities in collaboration with local school systems.

Key policy instruments include the integration of the initiative into the **annual educational plans (POF-Piano dell'Offerta Formativa)** of schools and alignment with municipal environmental regulations and the Regional Waste Management Plan (PRGR-Piano Regionale di Gestione dei Rifiuti).

Institutional prerequisites include formal agreements with waste management operators to ensure certified collection and logistics, as well as coordination with schools



to embed activities within the academic calendar. The availability of existing collection infrastructure is essential to support the system.

MARCHE REGION

The adoption of OWEEE PROCURE requires a **multi-level governance framework**, involving national, regional, and local levels.

At national level, centralised procurement systems (e.g. CONSIP) define framework agreements; at regional level, procurement bodies (e.g. SUAM) adapt and implement these frameworks; at local level, operational stakeholders manage reuse and collection processes.

Key policy instruments include the Regional Waste Management Plan (PRGR), the Regional Waste Prevention Programme (PRPR), Green Public Procurement (GPP) guidelines, and national or regional procurement frameworks.

Institutional prerequisites include the integration of circular criteria into procurement procedures and the establishment of standardised protocols for certified data sanitisation, ensuring compliance with regulatory and security requirements.

14.5. Stakeholder Alignment and Governance Pathway

UCPB

The WP3 process involved schools (principals and teachers), families, the local waste management operator, and regional institutional representatives.

A very high level of alignment was observed: schools expressed strong willingness to repeat the initiative, and the technical partner confirmed support for future activities.

The governance pathway for endorsement is based on local institutional commitment, with the Union of Municipalities coordinating the integration of the initiative into school programmes, supported by formal agreements with schools and the waste management operator.

MARCHE REGION

The WP3 process engaged regional IT departments, administrative and procurement offices, reuse centres, repair professionals, schools, and technical partners.

A high level of alignment was observed on the need to develop reuse models and awareness initiatives, while some concerns remain regarding data protection procedures and associated costs.

The governance pathway for endorsement is based on institutional coordination at regional level, integrating circular procurement principles into existing frameworks and ensuring alignment between administrative, technical, and policy actors.

14.6. Endorsement Statement

UCPB

Through this Local Action Plan, the Union of Municipalities of Pian del Bruscolo acknowledges the relevance and effectiveness of the WEEE BEHAVE solution and expresses its commitment to consider its integration into local environmental policies





and educational programmes, in line with institutional competences and applicable regulatory frameworks.

MARCHE REGION

Through this Local Action Plan, the Marche Region acknowledges the relevance of the OWEEE PROCURE solution and expresses its commitment to consider its future adoption within regional policy and procurement frameworks, ensuring alignment with institutional competences, data protection requirements, and applicable regulations.





15. CONCLUSIONS

The project has proven to be a pivotal initiative in addressing the escalating challenge of electronic waste (e-waste) across Europe. By fostering collaboration and encouraging knowledge exchange among participating regions, it effectively bridged the gap between existing local and regional policies and the ambitious targets set by the EU's Circular Economy Action Plan. This success was achieved through a comprehensive, lifecycle-based strategy that addressed e-waste management from collection to final treatment.

Key focus areas included increasing collection rates, promoting the reuse and refurbishment of electronics, and ensuring environmentally responsible and efficient recycling practices. This holistic approach empowered each region to develop and implement tailored policies, while also promoting a culture of collaboration and shared learning. The ripple effect of this cooperation holds the potential to influence e-waste management practices well beyond the original eight participating regions, benefiting the broader EU landscape.

Moreover, the project laid a practical foundation for enhancing e-waste management at the local and regional levels. By adopting targeted improvements—such as public awareness campaigns, incentivized reuse and refurbishment schemes, more accessible e-waste collection infrastructure, and detailed regional management plans—authorities can make meaningful progress toward circular economy goals. Advocating for Extended Producer Responsibility (EPR) schemes can further support sustainable e-waste management by assigning producers financial responsibility for their products at end-of-life.

Building on these achievements, project partners will now develop a Methodology for Designing Strategies and Action Plans (APs) for e-waste prevention and management in the Mediterranean. These strategies will be implemented through eight Action Plans and tested via three innovative pilot actions:

- WEEE REUSE: Fostering social enterprises and community initiatives to manage WEEE and create employment opportunities.
- WEEE PROCURE: Promoting a new eco-innovative business models based on the eco-renting of EEE, in cooperation between the demand side and the offer side, which allows the creation of a new eco-business
- WEEE BEHAVE: Increasing public awareness and engagement in e-waste management practices.





16. REFERENCES

- A. Haarman, F. Magalini, J. Courtois (2020), Study on the Impacts of Brominated Flame Retardants on the Recycling of WEEE plastics in Europe. <https://www.bsef.com/wp-content/uploads/2020/11/Study-on-the-impact-of-Brominated-Flame-Retardants-BFRs-on-WEEE-plastics-recycling-by-Sofies-Nov-2020-1.pdf>
- European Commission (2020) Circular Economy Action Plan. <https://circabc.europa.eu/ui/group/6e9b7f79-da96-4a53-956f-e8f62c9d7fed/library/37e8e207-6222-4212-ad7c-e809e64df72c>
- European Commission (2021a): Batteries and accumulators. https://ec.europa.eu/environment/topics/waste-and-recycling/batteries-and-accumulators_en
- European Commission (2021b): Waste and recycling. https://ec.europa.eu/environment/topics/waste-and-recycling_en.
- European Commission, Directorate-General for Environment, Romagnoli, V., Bruijne, E., Drapeau, P. (2022). Study on options for return schemes of mobile phones, tablets and other small electrical and electronic equipment in the EU, Publications Office of the European Union. <https://data.europa.eu/doi/10.2779/237189>
- European Commission, Directorate-General for Environment, Weißenbacher, J., Magalini, F., Lecerf, L. (2015). Study on WEEE recovery targets, preparation for re-use targets and on the method for calculation of the recovery targets: final report, Publications Office. <https://data.europa.eu/doi/10.2779/235063>
- European Parliament and Council (11/22/2008): DIRECTIVE 2008.98.EC on Waste (WFD).
- European Parliament and Council (12/20/1994): DIRECTIVE 94.62.EC on packaging and packaging waste.
- European Parliament and Council (7/4/2012): DIRECTIVE 2012/19/EU on waste electrical and electronic equipment (WEEE).
- European Parliament and Council (7/6/2006): DIRECTIVE 2006/66/EC on batteries and accumulators and waste batteries and accumulators.
- F. Magalini, J. Courtois, A. Concheso, C. Heinz (2021), Extended Producer Responsibility schemes and their strategic role for producers. <https://www.consultdss.com/content-hub/extended-producer-responsibility-schemes/>
- Forti, Vanessa, Baldé, Kees and Kuehr, Ruediger (2018), E-waste Statistics: Guidelines on Classifications, Reporting and Indicators, second edition. <https://collections.unu.edu/view/UNU:6477#viewMetadata>
- M. A. Tortarolo (2023), Circular economy: management of waste electrical and electronic equipment (WEEE) in Europe. <https://repositori.uji.es/xmlui/handle/10234/203322?show=full>
- OECD (2016), Extended Producer Responsibility: Updated Guidance for Efficient Waste Management, OECD Publishing, Paris. DOI: <http://dx.doi.org/10.1787/9789264256385-en>
- RREUSE (2002), The Management of Waste Electrical and Electronic Equipment – A Guide for Local Authorities. <https://rreuse.org/wp-content/uploads/00028-Brochure-ACRR-Part-I.pdf>
- RREUSE (2021), Job creation in the re-use sector: Data insights from social enterprises. <https://rreuse.org/job-creation-in-the-re-use-sector-data-insights-from-social-enterprises/>
- S. Šipka (2021), Towards circular e-waste management: How can digitalisation help? https://www.epc.eu/content/PDF/2021/E-waste_DP_v5.pdf
- SCYCLE Programme, United Nations Institute for Training and Research (UNITAR) (2022), C.P. Baldé, G. Iattoni, C. Xu, T. Yamamoto, Update of WEEE Collection Rates, Targets, Flows, and Hoarding – 2021 in the EU-27, United Kingdom, Norway, Switzerland, and Iceland, 2022. [https://www.scycle.info/new-study-update-of-weee-collection-rates-targets-flows-and-hoarding/#:~:text=The%20WEEE%20generated%20also%20shows,kg%2Finhabitant\)%20in%202021](https://www.scycle.info/new-study-update-of-weee-collection-rates-targets-flows-and-hoarding/#:~:text=The%20WEEE%20generated%20also%20shows,kg%2Finhabitant)%20in%202021)





- United Nations Environment Programme (2007), E-Waste Vol.1: Inventory Assessment Manual. <https://www.unep.org/ietc/resources/toolkits-manuals-and-guides/e-waste-vol3-weeee-waste-%E2%80%9Ctake-back-system%E2%80%9D>
- United Nations Environment Programme (2007), E-Waste Vol.2: E-waste Management Manual. <https://www.unep.org/ietc/resources/toolkits-manuals-and-guides/e-waste-vol3-weeee-waste-%E2%80%9Ctake-back-system%E2%80%9D>
- United Nations Environment Programme (2012), E-Waste Vol.3: WEEE/E-Waste “Take Back System”. <https://www.unep.org/ietc/resources/toolkits-manuals-and-guides/e-waste-vol3-weeee-waste-%E2%80%9Ctake-back-system%E2%80%9D>
- United Nations Environment Programme (2017), Compendium of Technologies for the Recovery of Materials from WEEE / E-waste. <https://www.unep.org/ietc/resources/report/compendium-technologies-recovery-materials-weee-e-waste>
- United Nations Institute for Training and Research (UNITAR), C.P. Baldé, E. D’Angelo, V. Luda O. Deubzer, and R. Kuehr (2022), Global Transboundary E-waste Flows Monitor. https://ewastemonitor.info/wp-content/uploads/2022/06/Global-TBM_webversion_june_2_pages.pdf
- United Nations University (UNU) / United Nations Institute for Training and Research (UNITAR) (2020) C.P. Baldé, M. Wagner, G. Iattoni, R. Kuehr, In-depth Review of the WEEE Collection Rates and Targets in the EU-28, Norway, Switzerland, and Iceland. https://www.scycle.info/wp-content/uploads/2020/11/In-depth-review_WEEE-Collection-Targets-and-Rates_UNITAR_2020_Final.pdf
- Urban Mine Platform. (n.d.). <http://www.urbanmineplatform.eu/urbanmine/eee/weightpercapita>
- Urban Mine Platform. <http://www.urbanmineplatform.eu/homepage>
- WEEE Forum (2020), An enhanced definition of EPR and the role of all actors. https://weee-forum.org/wp-content/uploads/2020/11/EPR-and-the-role-of-all-actors_final.pdf
- WEEE Ireland (2022), WEEE annual Environmental report 2022 <https://www.weeeireland.ie/weee-annual-environmental-report-2022/>





Annexes

Annex 1 – Annex Title





EWAsTER

Interreg
Euro-MED



Co-funded by
the European Union