



# 20 YEARS OF THE WEEE EPR SCHEME IN POLAND

Diagnosis, challenges and recommendations

Towards a resilient and transparent e-waste  
management system





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# 20 years of the WEEE EPR scheme in Poland

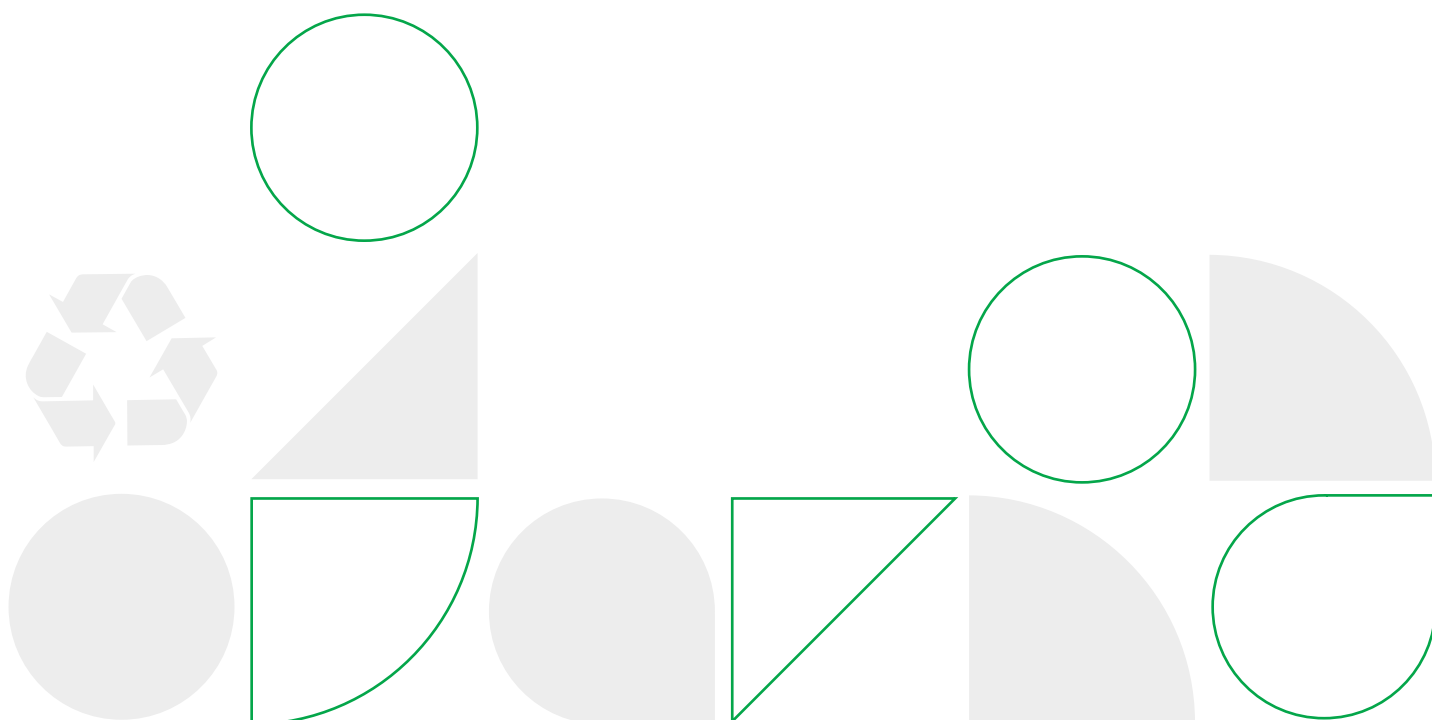
## Diagnosis, challenges and recommendations

**Towards a resilient and transparent e-waste management system**

ElektroEko Organizacja Odzysku Sprzętu Elektrycznego i Elektronicznego S.A.

WEEE Forum

September 2025



## ElektroEko Organizacja Odzysku Sprzętu Elektrycznego i Elektronicznego S.A.

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President of the Management Board of ElektroEko S.A.

## Preface

*Twenty years have passed since the establishment of the waste electrical and electronic equipment management system in Poland and the launch of ElektroEko's operations. This is a good moment to look back and summarize the path we have travelled together. Much has been accomplished during this period. A functional collection system has been established, effectively eliminating the issue of equipment being abandoned in forests or near waste containers. There has been a huge change in environmental education – awareness among Poles has risen from 1% in 2007 to 75% today. Processing technologies have also developed, and treatment plants in Poland have become modernized, in many cases equipped with their own laboratories and environmental protection solutions. ElektroEko has played an instrumental role in each of these areas.*

*As a member of the WEEE Forum, we can look at the Polish system in a broader European context. We are observing how extended producer responsibility systems function in other countries – some have been successful, while others are facing challenges. This gives us an opportunity to learn from both good practices and mistakes, while at the same time warning us against threats such as excessive centralization or insufficient law enforcement. However, discussions on the future*

*shape of the system are not limited to Poland, but are taking place throughout the European Union. It is already clear that calculations based on POM have not produced the expected results. On the other hand, there is concern that penalties for uncollected equipment would go to the general EU budget instead of supporting the development of the collection and waste treatment system. Now is the time to have a serious discussion about the necessary changes and what the future model of extended producer responsibility for WEEE should look like.*

*The report has three objectives: comparison, analysis, and initiation of an open discussion on the direction of change. That is why we present twelve pillars which, in our opinion, should form the basis of a new, better WEEE EPR scheme. This is an invitation to a debate that should result in a model that is more transparent, stable, and resistant to market fluctuations.*

*I would like to thank all our partners who took the time to share their knowledge and experience, and I invite you to read this publication and draw your own conclusions.*





# Executive Summary

## PURPOSE OF THE REPORT

The report analyzes extended producer responsibility (EPR) systems in the waste electrical and electronic equipment (WEEE) economy in selected European countries, comparing their effectiveness with the Polish model. The study was prepared in the context of growing environmental, economic, and legislative challenges, as well as fiscal mechanisms planned by the European Union related to uncollected electronic waste. The conclusions and recommendations are based on the experience of countries with the highest collection and recycling rates in order to indicate directions for building a stable, effective, and socially acceptable system in Poland.

## SCALE OF THE PROBLEM

Waste electrical and electronic equipment is the fastest growing waste stream in the world. In 2022, global e-waste reached a record high of 62 million tons, of which only 22.3% was properly collected and recycled. Despite having the highest collection rate in the world (42.8%), Europe still faces a significant collection gap. In Poland, the collection rate increased from 3 kg/capita in 2010 to 14.6 kg in 2022, but the system still suffers from limited transparency, the presence of parallel streams, and conflicts of interest resulting from the capital links between PROs and treatment plants.

## KEY FINDINGS

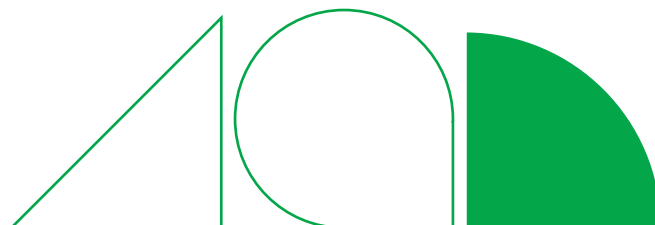
An analysis of European experience shows that there is no single universal model for a national extended producer responsibility (EPR) system for WEEE. However, effective solutions share common elements: a strong role for producers, financial transparency, central – though not state – coordination, mandatory participation of all market players, and enforcement of WEEE transfer exclusively to authorized entities. Models based on excessive centralization, such as state monopolies, carry the risk of reduced transparency, underfunding, and lower collection rates, as well as uncontrolled cost increases and corruption.



## TWELVE PILLARS OF THE MODEL EXTENDED PRODUCER RESPONSIBILITY SYSTEM FOR WEEE:

Based on research and analysis, twelve pillars have been identified that should form the foundation of an effective, resilient, and reliable WEEE EPR scheme:

- 1. Clear and controllable ownership structure** – Ensures genuine representation of producers and eliminates the influence of entities with opaque connections. This is a prerequisite for trust and effective oversight of the entire chain.
- 2. Not-for-profit principle** – A defined public purpose and reinvestment of surpluses reduce pressure for short-term profit, stabilize costs, and direct funds directly into systemic and educational activities.
- 3. Full legal and financial independence of PROs from treatment plants** – Minimizes conflicts of interest and enables objective quality and cost control at the collection, transport, processing, and recycling stages.
- 4. Increased mandatory capital for PROs (minimum PLN 20 million)** – It builds financial resilience and ensures operational continuity during periods of market volatility (commodity prices, volumes, logistics costs).
- 5. Transparency and auditing (The Wase Database – Database on Products, Packaging and Waste Management)** maintained by the Ministry of Climate and Environment in Poland – Complete and comparable reporting creates an evidence base for oversight, cost and quality benchmarking, and enforcement of responsibilities.
- 6. Clearing house** – a central coordinator of the system, independent of public administration – Based on reliable data, it distributes responsibilities and costs, reduces arbitrage, ensures consistency of methodologies, and provides a “single version of the truth” for the entire system.
- 7. Mandatory handover** – the obligation to transfer WEEE exclusively to authorized entities – Limiting situations in which equipment ends up in parallel streams, sealing the system and increasing the volume in official circulation.
- 8. All actors** – shared responsibility of all participants in the system – It reinforces the practice whereby consumers, producers, collectors, treatment facilities, and PROs share objectives and standards – from the design of activities to their enforcement.
- 9. Maintaining competitiveness and avoiding nationalization of the system** – Protects against the negative effects of monopoly (costs, decline in quality, risk of politicization) and maintains incentives for operational efficiency.
- 10. Creation and stabilization of the market for recycled raw materials (subsidies for recycled materials, tax breaks, promotion of use)** – Demand and supply incentives close the loop: when recycled materials compete in terms of price and quality, the profitability of legal streams and investments in technologies increases.
- 11. Environmental education carried out by independent entities** – Raises awareness and accessibility of proper WEEE disposal channels, strengthening the effectiveness of *mandatory handover* and reducing “parallel” flows.
- 12. Participation in legislative work and international organizations** – Ensures the flow of best practices, harmonization with EU standards, and continuous updating of the system in response to new technologies, business models, and risks.



## EIGHT GROUPS OF MARKET PARTICIPANTS TO CONSIDER WHEN CHANGING THE WEEE EPR SCHEME IN POLAND:

1. **Producers and PROs** are the main financing and designing entities of the system. They register equipment placed on the market, report weights, contract collection and treatment services, and supervise contractors.
2. **Retail and e-commerce** are the first point of contact with consumers and are responsible for collecting waste equipment, organizing reverse logistics, and reporting quantities. Industry documents emphasize the importance of developing reverse logistics and pick-up services upon delivery.
3. **Residents/consumers** are the first waste managers – they decide the fate of the equipment. They can take it to legal collection points or keep it at home (so called hoarding), which reduces the effectiveness of the system. Official reports clearly indicate that it is the residents who determine the effectiveness of the collection.
4. **WEEE treatment plants and recyclers** must operate in accordance with EN 50625/WEEELABEX standards and provide full reporting.
5. **The scrap sector and plastics recyclers** are required to separate waste equipment from the scrap stream and send it exclusively to authorized facilities.
6. **The secondary market and entities preparing equipment for reuse** are responsible for tracking the flows of waste equipment, reporting cross-border transactions, and cooperating with PROs to balance the volumes remaining in secondary circulation.
7. **Local governments** provide collection infrastructure and conduct educational activities. The WEEE Forum emphasizes the role of local authorities in creating accessible collection networks and cooperating with PROs.
8. **Control and surveillance** – customs, the Regional Inspectorate for Environmental Protection, and the Trade Inspection – play a key role in combating illegal exports, misclassification, and parallel trade.

## RECOMMENDATIONS FOR POLAND

- Maintaining the model based on independent organizations representing producers.
- Maintaining the mandatory transfer of WEEE to entities professionally involved in waste management, possessing appropriate technologies and permits.
- Developing transparency and audit mechanisms, including full use of the Database on Products, Packaging and Waste Management maintained by the Ministry of Climate and Environment in Poland, including public access to aggregated data from the Database on Products, Packaging and Waste Management maintained by the Ministry of Climate and Environment in Poland.
- Strengthening educational activities in partnership with local governments and non-governmental organizations.
- Increased control over the registration of distributors, especially in e-commerce.
- Considering the use of trust funds for products with a long life cycle.
- Introducing public trust status for PROs (*not-for-profit*).
- Fully enforcing provisions of the Waste Equipment Act concerning the possibility of establishing PROs by producers and their associations, together with periodic verification of the implementation of these provisions.
- Creating a market for the economic justification of using recycled raw materials.

## METHODOLOGY

The report is based on:

- the analysis of EU and Polish legal acts, industry reports, scientific publications, and strategic documents,
- eight interviews with experts from Poland and the EU, representing producers, industry organizations, treatment plants, and the education sector,
- a survey conducted among members of the WEEE Forum from Austria, Belgium, France, Spain, Canada, Luxembourg, the Netherlands, Norway, the Czech Republic, Slovenia, and Italy,
- analysis of Eurostat data, *Global E-waste Monitor 2024*, and operational data from PROs.

# GLOSSARY

**All actors** – a model in which all entities with access to WEEE – both private and public – are subject to minimum legal obligations (including compliance with regulations, reporting, meeting standards, and communication), working together to ensure a responsible system for the collection, treatment, and reporting of WEEE, including outside of producer channels.

**BDO** – Database on products and packaging and on waste management (the Waste Database). An ICT system used to record and monitor waste flows in Poland.

**Blockchain** – a distributed and cryptographically secured database in which information (e.g. transactions) is recorded in successive blocks connected chronologically into a single chain; it ensures immutability, transparency, and verifiability of data without the need for a central intermediary.

**Clearing house** – a central institution coordinating the activities of PROs in a given country, including the allocation of collection responsibilities and reporting of results.

**CRM (Critical Raw Materials)** – raw materials of strategic importance to the EU economy, whose availability is limited due to high concentration of supply or difficulties in replacing them. In the context of WEEE, these include rare earth metals, lithium, cobalt, and palladium recovered from electronic waste.

**Refrigerants** – substances used in refrigeration, air conditioning, and heat pump equipment that require special handling due to their ozone-depleting potential or high global warming potential.

**Directive 2024/884** – European Union legal act introducing changes to the regulations concerning waste electrical and electronic equipment.

**WEEE Directive 2** – Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment, laying down rules for the collection, treatment, and recycling of WEEE.

**Free-riding** – the phenomenon of placing electrical and electronic equipment on the market without fulfilling the registration and financial obligations arising from the provisions on extended producer responsibility.

**WEEE product groups** – six categories of electrical and electronic equipment specified in EU regulations, including temperature exchange equipment, screens, lamps, large and small equipment.

**Historical waste** – equipment placed on the market before a specific cut-off date, subject to specific rules on financing collection and treatment.

**Not-for-profit** – a model of operation for a PRO in which any financial surpluses are reinvested in the pursuit of statutory objectives rather than allocated to shareholders' profits.

**Educational obligations** – the requirement to conduct information and educational activities on the proper handling of WEEE, financed and implemented by producers or PROs.

**Mandatory handover** – a rule according to which all collected WEEE must be transferred exclusively to PROs or companies with appropriate permits, excluding collection and processing by unauthorized entities.

**Open scope** – the principle of open scope of application of regulations, effective from August 15, 2018, covering all types of electrical and electronic equipment, unless otherwise specified by the regulations.

**Logistics operator** – an entity responsible for the physical collection and transport of WEEE from collection points to treatment facilities.

**Producer Responsibility Organization (PRO)** – an entity acting on behalf of producers, fulfilling their obligations in the field of collection, processing, recycling, and education concerning WEEE.

**POM (Put on the Market)** – the weight of electrical and electronic equipment placed on the market in a given period, expressed in tons.

**PSZOK** – Selective Municipal Waste Collection Point, where residents can dispose of waste electrical and electronic equipment free of charge.

**Recyclate** – secondary material produced from waste, suitable for reuse in production. In the case of WEEE, these include, for example, recovered metals, plastics, and glass, which replace primary raw materials.

**Recycler** – an entity specializing in recycling processes.

**Recycling** – recovery in which waste is reprocessed into products, materials, or substances used for their original purpose or for other purposes; this includes the reprocessing of organic material (organic recycling), but does not include energy recovery or reprocessing into materials to be used as fuels or for earthworks.

**EPR (Extended Producer Responsibility)** – a legal principle whereby producers are financially and organizationally responsible for the management of equipment at the end of its life cycle.

**EEE** – electrical and electronic equipment, understood as a product placed on the market.

**Waste stream** – a specific category of waste (e.g. WEEE, batteries, packaging) analyzed in the context of its flow within the waste management system.

**Critical raw materials** – raw materials of strategic importance to the EU economy, characterized by a high risk of supply shortages and difficulty in replacing them with other materials.

**Takeback (Netherlands)** – a mechanism used in the EPR system for waste electrical and electronic equipment, introduced in 2021 by Stichting OPEN. It involves cooperation with metal recovery companies, which, in exchange for remuneration, are required to transfer WEEE to authorized treatment plants. This solution aims to reduce informal e-waste streams, increase the level of selective collection, and improve the quality of data reported in the system.

**WEEE Act** – Act of September 11, 2015 on waste electrical and electronic equipment (Journal of Laws of 2015, item 1688, as amended), regulating the obligations of producers, PROs, collectors, treatment facilities, and other entities in the system.

**Waste Act** – Act of December 14, 2012 on waste (Journal of Laws of 2013, item 21, as amended), specifying the rules for waste management, including requirements for recording, transport, processing, and recovery.

**WG (Waste Generated)** – the weight of waste generated in a given period, expressed in tons.

**WEEE** – *Waste Electrical and Electronic Equipment*, English equivalent of the term WEEE used in EU documents and regulations.

**WEEE Forum** – an international association of WEEE PROs, working to exchange experiences, harmonize standards, promote good practices, and develop collection systems.

**Producer** – an entity that places electrical and electronic equipment on the market within the country, under its own brand or as part of import or intra-EU acquisition.

**Treatment plant** – a facility with the necessary permits to accept, dismantle, and process WEEE in accordance with legal requirements.

**Collector** – an entity engaged in the collection or accumulation of WEEE, e.g. a store, municipal waste collection point, transport company, or municipal enterprise.

**WEEE** – waste electrical and electronic equipment, including waste generated after the end of the useful life of electrical and electronic equipment.







# Introduction



## Why e-waste?

Waste electrical and electronic equipment (WEEE) is the fastest growing waste stream in the world – in 2022, it reached 62 million tons, of which only 22.3% was properly collected and recycled (Baldé et al. 2024).

*Despite having the highest collection rate in the world (42.8%), Europe still struggles with the gap between the required and the actual collection levels.*

In Poland, the collection rate rose from 3 kg/capita in 2010 to 14.6 kg/capita in 2022. This was due to the rapid increase in the number of new devices and the emergence of new products previously unknown to users (Eurostat 2025b). However, the system requires improved transparency, more effective control, and the elimination of conflicts of interest among individual market participant. Legal stability and uniform interpretation of existing regulations are also essential.

The ElektroEko model shows that it is possible to combine environmental efficiency, cost stability, and trust among producers. Since 2006, the organization has collected over 1.5 million tons of WEEE (approximately 40% of the national total), it is the only Polish member of the WEEE Forum, and it is a leader in educational activities (WEEE Forum 2019a; MMbE 2025).

## In search of effective solutions

For years, Europe has been applying the principle of extended producer responsibility, under which manufacturers, importers, and distributors finance and organize the collection, treatment, and recycling of electronic waste. PROs play a key role, and vary in legal form, ownership model, and scope of responsibility from country to country.

These systems not only support the achievement of EU environmental goals, but also reduce the demand for primary raw materials, including critical raw materials (Deloitte & WEEE Forum 2025).

## Poland compared to Europe

Although based on the same EU regulations, the Polish system operates under the model of commercial law companies (Journal of Laws 2025, item 1688). Capital links between some PROs and treatment plants may reduce transparency, increase the risk of irregularities, and hinder the achievement of actual collection targets. Most PROs do not meet the basic requirement of being established by producers or their associations. This condition is also not subject to review over time.

*Poland exceeds the EU average in WEEE collection – 14.6 kg/capita compared to 11.2 kg in the EU (Eurostat 2022), but the actual weight processed may be lower than declared.*

Issues such as parallel streams, control of mass flows and costs, and regulatory inconsistencies remain unresolved.

## ElektroEko's position in the Polish and European context

ElektroEko occupies a special position in the Polish WEEE management system as the largest PRO, operating continuously since 2006. The organization stands out on the domestic market thanks to several key features:

- one of the few organizations actually established and controlled by producers – ElektroEko was created on the initiative of the largest manufacturers and importers of electrical and electronic equipment, which ensures that their actual obligations are represented and costs are optimized within the system,
- the only Polish PRO that is a member of the WEEE Forum – a prestigious organization bringing together 51 organizations from 33 countries, where membership means meeting the highest standards of transparency and operational efficiency (WEEE Forum 2019a),
- by far the greatest contribution to education **of the society and shaping knowledge related to the recovery of raw materials**,
- official organizer of International E-Waste Day in Poland – as a representative of the WEEE Forum, ElektroEko coordinates this global educational initiative in cooperation with UNEP/GRID-Warsaw (ElektroEko 2025a).

*To date, ElektroEko has organized and financed the collection of over 1.5 million tons of waste equipment, which accounts for approximately 40% of the total weight collected in Poland (MMbE 2025).*

## Objectives and research questions of the report

The report covers five main areas of research that correspond to its analytical and recommendation objectives. Each of them leads to specific questions and conclusions developed in subsequent sections of the publication.

### 1. STRUCTURE AND FUNCTIONING OF PROs

The aim is to analyze how WEEE EPR schemes are organized in different European countries – who establishes PROs, what their ownership and operational structure is, and what their relationship with public administration looks like.

#### RESEARCH QUESTIONS:

- What models of PROs operate in different European countries?
- What are the legal statuses, responsibilities, and levels of oversight for PROs?
- How is the responsibility distributed among producers, administrators, consumers, treatment plants, and recyclers in different systems?

### 2. REPRESENTATION OF PRODUCERS AND CONSUMERS

Assessment of the extent to which PROs act in the interests of producers and, indirectly, consumers. Particular attention was paid to the issue of capital links between PROs and treatment plants and their impact on costs, service quality, and the reliability of the system.

#### RESEARCH QUESTIONS:

- Who actually controls PROs – producers, companies unrelated to placing equipment on the market, or waste electrical and electronic equipment treatment facilities?
- Is the system transparent in terms of determining costs and service quality?
- To what extent does the current model in Poland ensure representation of the interests of producers and their customers?

### 3. OPERATIONAL EFFICIENCY AND OVERSIGHT

The aim is to examine how individual systems cope with collection efficiency, control of mass and financial flows, data utilization, and auditing.

#### RESEARCH QUESTIONS:

- What are the collection and recycling rates in Poland compared to other EU countries?
- What solutions increase transparency – modern reporting systems (The Waste Database), audits, central registers?
- What are the best practices for supervision and control in other countries?

### 4. THE FOUNDATIONS OF A MODEL WEEE MANAGEMENT AND PRODUCER RESPONSIBILITY ORGANIZATION

The purpose of this section is to present the key pillars of an effective and resilient extended producer responsibility system for waste electrical and electronic equipment. The elements analyzed include, among others: the need to take into account all market participants (*all actors*), the obligation to transfer WEEE exclusively to authorized entities (*mandatory handover*), the existence of a central system coordinator (*clearing house*), and the requirement to maintain adequate operating capital to ensure financial stability and continuity of operations.

#### RESEARCH QUESTIONS:

- What are the common features of the most effective extended producer responsibility systems for WEEE in Europe?
- What mechanisms ensure operational neutrality and minimize the risk of conflicts of interest?
- What conditions must the WEEE EPR scheme meet in order to ensure stability, cost-effectiveness, and the trust of producers, consumers, and other market players?

### 5. REGULATORY RECOMMENDATIONS AND DIRECTIONS FOR CHANGE

The aim is to determine what changes the Polish system needs to undergo in order to comply with new EU regulations (Directive 2024/884/EU, EU own resources based on WEEE) and what the model should look like for the coming decades.

#### RESEARCH QUESTIONS:

- What legislative changes are necessary at the national and EU level?
- What effects could the planned EU fiscal mechanism based on the weight of uncollected WEEE have?
- How to build a resilient and reliable financing system for the WEEE economy?

## Scope and methodology of the report

The report was prepared on the basis of a comprehensive assessment covering:

- 1. Document analysis** – review of European Union and Polish legal acts, industry reports, scientific publications, and strategic documents concerning the circular economy. Among other things, the WEEE Directive, reports by the European Commission and the European Parliament, studies by industry organizations, scientific publications, and the results of research projects on extended producer responsibility systems were taken into account.
- 1. Expert discussions** – with 10 experts from Poland and the European Union, representing, among others, industry organizations, equipment suppliers, treatment plants, the education sector, and international organizations. Respondents represented both the strategic and operational perspectives of the WEEE EPR.



1. **Survey of WEEE Forum members** – conducted in July 2025 among PROs from Austria, Belgium, France, Spain, Canada, Luxembourg, the Netherlands, Norway, the Czech Republic, Slovenia, and Italy. The questionnaire covered, among other things, the legal status and operating model of the PROs (not-for-profit, for-profit, mixed model), collection levels calculated using the POM and WEEE Generated methodology, the presence of clearing house mechanisms, regulations on the mandatory transfer of WEEE to authorized entities, the scope of educational responsibilities, sources of financing for the system, and key problems and challenges.
1. **Quantitative data analysis** – using official Eurostat data (2025a) on WEEE recycling rates and collection levels in EU Member States, data from the report Global E-waste Monitor 2024 (Baldé et al. 2024) presenting global trends in e-waste management, as well as operational data from PROs on collection rates, recycling efficiency, and system costs.

## Report structure

The report consists of five main sections:

- **Part 1:** The evolution of WEEE EPR schemes in Europe – how PRO models have changed and what challenges the EU faces today.
- **Part 2:** Poland in the context of Europe – analysis of the Polish system, its strengths and weaknesses,
- **Part 3:** Case studies and best practices from Europe – inspiration from France, Germany, Spain, Switzerland, and Norway.
- **Part 4:** Model example of PRO – what an effective, transparent, and sustainable WEEE EPR scheme should look like – a proposal by the authors of the report based on data and analyses from parts 1 to 3.
- **Part 5:** ElektroEko – its role and significance in the Polish WEEE EPR scheme.

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- **Industry experts** from Poland and Europe giving interviews: Maria Andrzejewska, UNEP/GRID–Warsaw; Michał Kanownik, Digital Poland Association; Tomasz Książek, Signify Poland and Baltic States; Wojciech Konecki, Applia Poland; Sebastian Królik, Terra Recycling; Pascal Leroy, WEEE Forum; Zygmunt Łopalewski, Beko Europe; Marek Maksymiuk, BSH Polska; Piotr Mazurek, Lewiatan Confederation; Piotr Stelmachow, Samsung Electronics Polska.



# 1 PRODUCER RESPONSIBILITY ORGANISATIONS IN EUROPE

A decorative graphic consisting of several light gray geometric shapes: a circle, a triangle, and a quarter-circle, arranged in a cluster. Below these is a green outline of a semi-circle.

## Introduction

The Polish economy currently operates largely on a linear model, as shown in *The Circularity Gap Report: Poland* (Circle Economy et al. 2022), only **10.2%** of resources used in the Polish economy (not only in the electrical and electronic equipment sector) are subject to closed-loop recycling, which places us well below the European average. The authors emphasize that **“increasing the level of collection, sorting, and reuse of electrical and electronic equipment can significantly reduce the demand for primary raw materials.”** The WEEE EPR scheme is therefore one of the key instruments in the transition to a circular economy.

*Over the past 20 years, Poland has made enormous strides forward in the management of waste electrical and electronic equipment (WEEE). In Poland, the collection rate rose from less than 3 kg/capita in 2010 to 14.6 kg/capita in 2022. This represents a fivefold increase, placing Poland above the EU average of 11.2 kg/capita. (Eurostat 2024b).*

This is an unprecedented success and proof of the growing environmental awareness of Polish society and the gradual improvement of collection infrastructure.

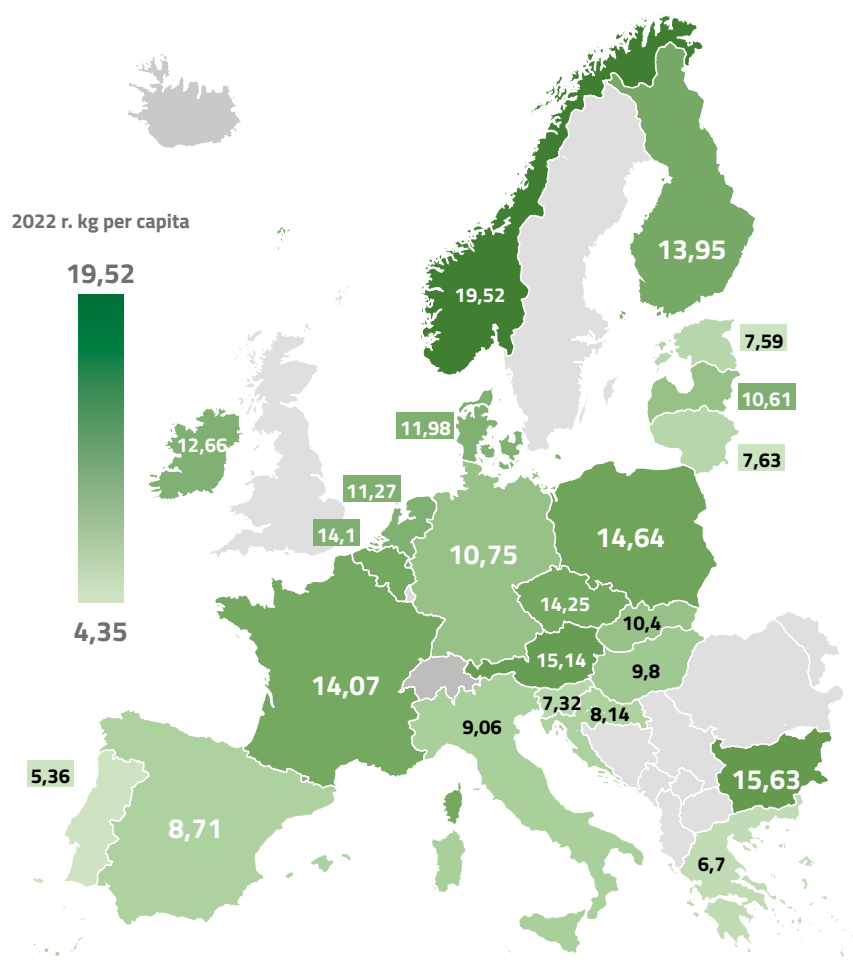


Chart 1. WEEE collection in 2022 kg per capita, Eurostat data

However, Poland is now at a crossroads. Without further reforms – including financial transparency and full control over mass flows and costs, optimization of the costs of managing waste equipment, stopping the process of withdrawing funds from the system, and addressing the imbalance between the rights and obligations of all participants in the system – Poland risks that its current success will not be sustainable.

One of the key challenges identified by circular economy researchers is the lack of a coherent link between the Circular Economy strategy and WEEE collection systems. As noted by Ghisellini et al. (2023),

*“The lack of integrated circular economy strategies at the municipal level limits the ability of systems to close material cycles.”*

This shows how important the role of PROs is, not only in collection, but also in designing systemic circular economy solutions.

„The principle of extended producer responsibility in WEEE legislation makes producers financially responsible for the costs of managing products at the end of their life. This responsibility can best be shared collectively for reasons of efficiency, which is why producers choose to set up PROs – collective entities that manage WEEE in an efficient and cost-effective manner. Over the past twenty years, various models have been introduced that made individual producers responsible for the end products they manufactured, but with very limited success.”

**Pascal Leroy**, Director General of WEEE Forum

## The evolution of WEEE collection and recycling systems in Europe

Effective management of waste electrical and electronic equipment has become one of the pillars of European environmental policy and the circular economy (European Parliament 2020). Over the past three decades, WEEE collection and treatment systems have undergone a dynamic evolution, from simple solutions based on administrative responsibility to extensive, complex systems involving manufacturers, retailers, local authorities, and consumers.

| YEAR           | EVENT                                                             | KEY CHANGES                                                                         |
|----------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 2003           | Entry into force of the Directive 2002/96/EC (WEEE1)              | WEEE collection system based on 10 categories of equipment. Poland: WEEE Act (2005) |
| 2002–2008      | Transposition of WEEE1 into national law                          | Poland: first WEEE Act (2005) and its amendment (2008)                              |
| 2012           | Adoption of the Directive 2012/19/EC (WEEE2)                      | Introduction of a plan to transition to an open scope system                        |
| 2014–2015      | Transposition of WEEE2 into national law                          | Poland: new WEEE Act (2015)                                                         |
| 15 August 2018 | Entry into force of the new division into 6 open scope categories | Inclusion of photovoltaic (PV) panels                                               |
| 2024           | Directive 2024/884/EU                                             | New PV rules, EPR review, future changes until 2025/2027                            |

Table .1 Milestones in EU WEEE legislation

The first EU WEEE Directive (2002/96/EC), adopted in 2003, imposed an obligation on Member States to organize WEEE collection and recycling systems (European Parliament and Council (EU) 2003). The aim was



to reduce the amount of waste going to landfills and increase the level of recovery of valuable raw materials. In 2012, the directive was revised (2012/19/EU) (European Parliament and Council of the European Union (EU) 2012), introducing more ambitious targets: collection of 65% of equipment placed on the market (POM) or 85% of the weight of waste electrical and electronic equipment generated (WEEE Generated – WG).

Since its entry into force, the **WEEE Directive** (2002/96/EC) has covered **10 categories of electrical and electronic equipment (EEE)**, which as specified in the annex to the directive. The WEEE Act, introduced in 2005, included in Annex 1 a catalog of groups and types of equipment corresponding to those specified in the directive, and additionally, in each group, the type “Other equipment...” was introduced, which was intended to enable the classification of any equipment (Journal of Laws 2005 no. 180, item 1495).

It is worth recalling that for some of the new Member States, including Poland, the original deadlines for achieving the required collection levels were postponed to allow them to adapt to the new requirements and build the appropriate systemic structures (Polish Press Agency 2015) (Journal of Laws 2017 item 1499).

## Current product groups of equipment

Another legislative revolution was the reduction of the number of product groups from 10 to the current 6 (European Parliament and Council (EU) 2018).

- 1. Equipment operating on the principle of temperature exchange** – including refrigerators, freezers, air conditioners, heat pumps, dryers; requires special handling due to refrigerants.
- 2. Screens, monitors, and equipment containing screens larger than 100 cm<sup>2</sup>** – TVs, monitors, laptops, tablets; require processing technology that takes into account glass and electronics.
- 3. Lamps** – fluorescent, LED, sodium, metal halide; contain hazardous substances (mercury).
- 4. Large equipment (any external dimension more than 50 cm)** – large household appliances, IT equipment, audio-video equipment, tools, toys, medical equipment (except for groups 1–3).
- 5. Small equipment, none of whose external dimensions exceed 50 cm** – small household appliances, consumer electronics, hand tools, electronic toys, small medical devices (except for groups 1–3 and 6).
- 6. Small IT and telecommunications equipment, none of whose external dimensions exceed 50 cm** – telephones, smartphones, tablets, routers, laptops, consoles; they contain valuable and critical raw materials.

## Latest legislative changes – Directive 2024/884/EU and new challenges for the WEEE EPR scheme.

In the following years, there was significant development of WEEE collection systems in many European countries, while at the same time the concept of a circular economy was being implemented.

*The new regulations promoted the design of products that were easy to dismantle, repair, and reuse, and also imposed obligations on producers to finance collection and environmental education (European Commission 2025a).*

On March 13, 2024, the new **Directive of the European Parliament and of the Council 2024/884/EU amending Directive 2012/19/EU on waste electrical and electronic equipment (WEEE)** (European Parliament and Council (EU) 2024) was adopted, introducing significant changes in the area of responsibility for waste photovoltaic panels. This amendment is a direct response to the verdict of the Court of Justice of the European Union of January 25, 2022 (case C-181/20), which challenged the retroactive application of extended producer

responsibility (EPR) provisions to PVs placed on the market before the entry into force of the previous regulations (*VYSOČINA WIND as przeciwko Česká republika – Ministerstvo životního prostředí 2022*).

## The latest industry proposals for reforming the WEEE EPR scheme

On July 17, 2025, ten leading European industry organizations – including APPLiA, DIGITALEUROPE, CCIA, Orgalim, CECAPI, EPTA, Eurovent, Lighting Europe, WEEE Forum, and Toy Industries of Europe – published a joint position paper on the systemic shortcomings of the current model for collecting and recycling waste electrical and electronic equipment and presented specific proposals for its reform (WEEE Forum et al. 2025).

The current mechanisms for setting collection targets are not adapted to market realities. According to the signatories, rules based on the quantity of equipment currently placed on the market do not take into account the varying life cycles of products, changing consumer trends, or delayed disposal.

*This leads to unrealistic and difficult-to-implement collection targets, as well as inefficient recovery of strategic raw materials, whose content does not directly translate into waste weight.*

In response to these challenges, industry organizations are proposing, among other things:

- **revision of the methodology for setting collection targets**, based on actual WEEE generation, taking into account data on product life cycles and consumer use;
- **introduction of material-specific recovery targets**, similar to the approach adopted in the Battery Directive;
- **harmonization of reporting systems** across the European Union to ensure comparability and consistency of data;
- **extension of the requirements of the directive to all entities dealing with WEEE**, including alternative collection channels, secondary trade, and operators independent of the recovery scheme.

This position reflects the growing conviction among market stakeholders that the current WEEE collection model does not ensure the effective achievement of environmental objectives or promote the efficient recovery of secondary raw materials. It also points to the need to implement an all actors approach, which assumes joint responsibility of all participants in the value chain for the implementation of the WEEE Directive requirements. It also signals a dangerous trend for all consumers, namely a significant increase in the prices of new products.

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“For entrepreneurs, proper waste management means reducing regulatory risks, building competitive advantage through a responsible image, and gaining access to increasingly environmentally conscious customers. From a systemic perspective, proper WEEE management supports the circular economy and reduces the consumption of primary raw materials.”

**Zygmunt Łopalewski, Beko Central Europe**

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## New EU budget proposals: e-waste as a source of own revenue

An additional impetus for reforming the WEEE EPR scheme in Europe may be the announcement contained in the new draft *Multiannual Financial Framework* (MFF) of the European Union for 2028–2034, presented by the European Commission on July 16, 2025.

The proposal envisages the introduction of a uniform rate on non-collected e-waste, estimated at €15 billion per year (European Commission 2025d). In addition to its fiscal purpose, this mechanism is intended to motivate countries with low collection efficiency to improve their performance. As Ursula von der Leyen (2025) emphasized, shortfalls in revenue collection will become a real burden on national budgets. Industry organizations (APPLiA, DIGITALEUROPE, and others 2025) are calling for a reform of the methodology used to set targets based on the actual generation of electronic waste (WEEE Generated).

The authors of the study *Designing and implementing extended producer responsibility under the EU Green Deal* (Mallick et al. 2024) note that “EPR should be designed as a tool for systemic change—not only as a source of financing for recycling, but as a lever for improving product design, reporting, and environmental responsibility.”. This approach supports the long-term goals of the EU’s circular economy policy and can serve as a reference point for the further development of PROs in Europe.

## The diversity of models for the recovery of electrical and electronic equipment in Europe

There are various models of PRO operating in Europe, ranging from centralized systems with a single organization, through multi-organization systems, to mixed models combining elements of competition and coordination. These organizations may take various legal forms and operating principles, depending on the national regulatory framework.

Despite the common legal framework established by the WEEE Directive, producers across Europe face significant differences in the implementation of regulations in individual countries. A comparative study of national differences in the implementation of the WEEE Directive in Europe (Andersen 2022) indicated that “one of the main problems from the perspective of manufacturers is the national diversity in the interpretation and implementation of the WEEE Directive.”.

*The diversity of registration and reporting procedures and organizational structures for electrical and electronic equipment recovery and management systems hinders effective planning and management of environmental obligations at the EU level.*

In countries such as Austria, Spain, and Italy, the model of multiple WEEE PROs prevails, which is intended to lead to greater cost efficiency and innovation. In these systems, producers have greater freedom to choose their partners, and organizations compete for customers through service quality and costs.

*In Central and Eastern Europe, where collection systems developed later, mixed models or commercial companies were often implemented, which was related to lower penetration of educational activities and less institutional capital.*

Poland is an example of a country that uses a model in which PROs are joint-stock companies (commercial law) (Deloitte and WEEE Forum 2025).

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„Producers of electrical and electronic equipment expect PROs to be effective in fulfilling their statutory obligations related to waste management, transparent in their operations, timely in their settlements, and reliable in their reporting. Important selection criteria include cooperation costs, market experience, as well as permits and certificates confirming compliance with regulations.”

**Marek Maksymiuk, BSH Polska**

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Additional factors differentiating the systems are:

- the scale and structure of the market (number and size of operators),
- the development of the waste treatment sector,
- the level of digitization and administrative supervision,
- the role of local governments, and the centralization of the system.

According to the study *National strategies for extended producer responsibility for sustainable management of waste electrical and electronic equipment (WEEE)* (Heikinheimo 2024),

*PROs operating on a not-for-profit model and subject to transparent oversight rules achieve better environmental results and enjoy greater trust among producers.*

This model serves as a reference point for further evolution of the Polish system.

## Scale, dynamics, and differences between countries – an introduction to country analyses

Systems for the recovery of electrical and electronic equipment operate in all European Union countries, but their effectiveness, structure, and maturity vary significantly.

*In recent years, the challenge for many countries has been not only to achieve the required collection rates, but also to ensure that the collected equipment is actually recycled and recovered, and that the systems are transparent.*

According to Eurostat data for 2022 (Eurostat 2022a), **the average weight of WEEE collected per person in the EU was 11.2 kg**, with an average level of equipment placed on the market of 32.27 kg per capita. The collection rate calculated using the POM methodology (i.e., as the ratio of the weight of WEEE collected to the average weight of equipment placed on the market in the previous three years) was **40.1%** at that time, which meant that most Member States did not meet the 65% target set by the WEEE Directive (2012/19/EU). According to Eurostat data, Bulgaria, Latvia and Slovakia constitute exceptions.

# Growth rate and systemic collection gap in the European Union (2010-2022)

Over the last decade, the market for electrical and electronic equipment in the European Union has expanded rapidly.

Between 2010 and 2022, the weight of equipment placed on the market increased from **7.9 million tons to 14.4 million tons**, an increase of 82%. During the same period **the weight of collected waste equipment** (collected WEEE) increased from **3.05 million tons to 4.99 million tons**, an increase of **63%** (Eurostat 2024b).

At first glance, it may seem that collection systems are developing faster than the market, but an absolute analysis shows the opposite. The difference between the amount of equipment placed on the market and the amount of WEEE collected, known as the **collection gap**, increased from **4.85 million tons in 2010** to **9.41 million tons in 2022**. This represents an increase of **94%** – despite the apparent increase in efficiency.

The more equipment enters the market, the more “disappears” from the system – it ends up in the gray market, is exported, goes to scrap collection points, or remains in households (WEEE Forum 2025c).

## POM, COLLECTION AND GAP 2010-2023 | WEEE FORUM

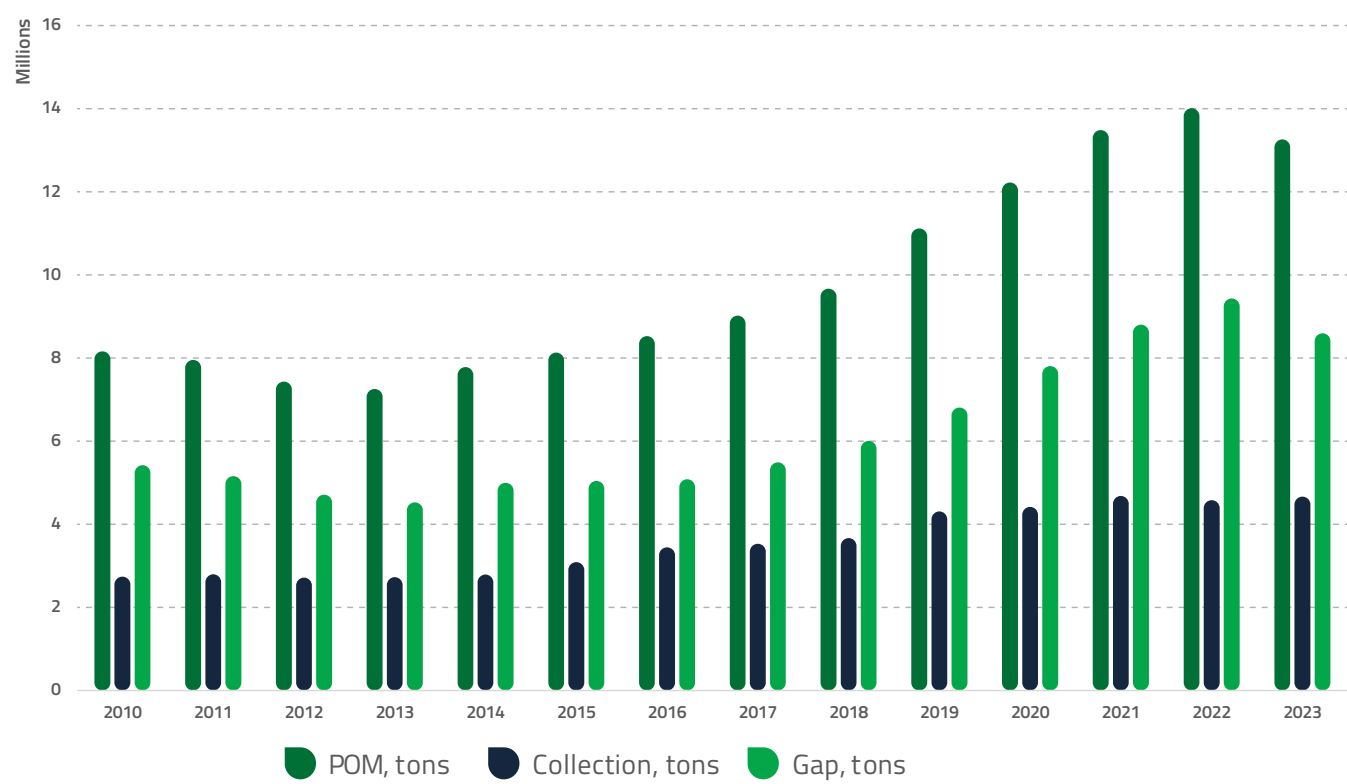


Chart 2. POM and collection in Europe 2010–2023, in tons; data from WEEE Forum

This gap – despite an apparent increase in collection efficiency – indicates that WEEE management systems in many countries are unable to control the growing volume of equipment leaving households or businesses.



It is worth noting that a significant proportion of WEEE does not enter the official collection system. However, it should be remembered that the increase in introduction is also largely due to the growing number of new products that are increasingly useful and functional, often have a longer life cycle, and will only be collected (when they become waste equipment) many years later.

*Equipment disappearing from the WEEE EPR scheme means not only the loss of valuable raw materials and increased environmental pressure, but also an increased risk of illegal processing and growing cost inequalities between companies that comply with regulations and those that circumvent them.*

From a regulatory perspective, it is necessary to reform performance indicators – currently, they are still largely based on declarative data that does not take into account actual waste streams, which makes it difficult to assess the actual effectiveness of the system.

„The current collection target based on POM is not fit for purpose – it does not use accurate estimates of WEEE generation. This results in an unachievable target, mainly due to the recent strong growth in the number of long-life electrical products being placed on the market. The WEEE Generated method provides a more robust metric for setting collection targets, as it takes into account the different life time distributions of WEEE products and is less sensitive to sudden market changes.”

**Pascal Leroy**, Director General of WEEE Forum

Later in this report, we will look at how different member states are dealing with these challenges, including Poland, whose system, despite progress, still requires in-depth structural reforms.

## Operational mechanisms of WEEE recovery schemes in Europe

The effectiveness of WEEE collection and treatment systems depends largely on the operational mechanisms used, such as *clearing houses*, *mandatory handover*, or an *all actors* approach, regardless of the organizational model adopted in a given country.

### Clearing house

Mechanism for central coordination of the WEEE collection and treatment system. Clearing house (e.g. **Stiftung EAR** in Germany, **OCAD3E** in France, **CdC RAEE** in Italy) is responsible for:

- distributing responsibilities for the collection of waste equipment between producers or their PROs,
- ensuring an even and transparent distribution of costs,
- monitoring data on collected WEEE and reporting.

*Systems with industry-wide centralization of information flow on the quantities of collected and processed equipment achieve an average collection rate that is **2.1 kg/capita** higher than the European average, as they minimize the risk of (free-riding) and improve cost fairness (Baldé at al. 2024).*

## **Mandatory handover (mandatory transfer of WEEE to certified entities)**

A legal solution introduced in France, among other countries, which:

- obliges all collectors (e.g. shops, municipal collection points) to transfer waste equipment exclusively to organizations with the appropriate permits or licenses,
- eliminates the gray market and informal waste flows.

*The mandatory handover mechanism has increased the level of WEEE collection by approximately **2.9 kg/capita**, while reducing the risk of illegal practices and raw material losses.  
(Baldé et al. 2024; Légifrance 2021).*

## **All actors approach (all participants in the system)**

The effective transformation of the WEEE management system towards a circular economy requires the involvement of all participants in the system—from producers and importers, through administration and PROs, to consumers. As emphasized by the authors of the assessment of changes in the waste electrical and electronic equipment management system in Poland (Przydatek i Kanownik 2024, 12), **“achieving the targets for separate collection and recycling is not possible without synergy between all participants in the system and a clear and stable political framework.”** The authors note that **the lack of cooperation and motivation on the part of stakeholders results in fragmentation of the system and low operational efficiency**, despite the formal existence of regulations.

The model involving all entities that have an impact on the flow of equipment assumes the active participation of:

- producers and importers,
- distributors and retailers,
- logistics operators and treatment plants,
- consumers and public administration.

*In countries such as Switzerland and the Netherlands, the all actors approach results in an additional 1.4 kg/capita of collection, higher recycling rates, and a reduction in informal flows and illegal practices  
(Baldé et al. 2020).*

Experts suggest that an effective transition to a circular economy requires “synergy between all participants in the system – from producers to consumers – and a clear policy framework” (Przydatek and Kanownik 2024). Lack of this cooperation, combined with ineffective control and low economic motivation, weakens the collection and processing system.

In Poland, industry representatives have been emphasizing the need for greater transparency and more effective control over the flow of waste equipment for years – from collection to processing and recycling. In their opinion, this is a prerequisite for the WEEE EPR scheme to not only be formally compliant with regulations, but above all—environmentally effective and fair to all market participants.

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„The problem with the waste industry is that it operates on the edge of the law. In these enormous masses, it is too easy to change waste codes or report quantities that differ from the actual amounts collected and treated. The control and supervision system is not sufficiently effective. If we add imprecise waste legislation to this, we have an environment in which it is easy for dishonest companies to operate. Efforts should be made to publish aggregated market data.”

**Wojciech Konecki**, Association of Home Appliance Manufacturers – APPLiA Polska

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## The impact of systemic mechanisms on collection efficiency and processing quality

### THE EFFECTS OF WEEE PROs OPERATION

According to the latest data published by Eurostat (2022a), the average WEEE collection rate in the European Union was 11.2 kg/capita. Despite the ambitious collection targets in force in the EU – 65% of the average weight of equipment placed on the market (POM) or 85% of the weight of waste generated (WEEE Generated) – only a few Member States actually achieve them. The 85% WEEE Generated level remains out of reach for most countries, and the 65% POM target is becoming increasingly difficult to achieve due to longer product life-cycles, a decrease in the weight of equipment, and the growing share of small, lightweight electronics (Deloitte & WEEE Forum 2025).

Examples from 2022:

- **Norway:** approx. **19.5 kg of WEEE per capita** per year
- **Liechtenstein:** approx. **15.5 kg per capita.**
- **Austria:** approx. **15 kg per capita.**
- **Poland:** over **14.6 kg per capita.**
- **Average EU level:** approx. **11.2 kg per capita.**

*When operational management is based on administrative structure rather than industry expertise, innovation declines and social participation is limited (Nerdjes et al. 2024).*

This risk also exists in WEEE EPR scheme – nationalization threatens to demotivate stakeholders and disconnect decisions from market realities.

| THREAT                                 | DESCRIPTION ACCORDING TO NERDJES ET AL. (2024)                                                                     |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Politicization of decisions</b>     | Environmental priorities may give way to political interests or current fiscal goals.                              |
| <b>Blurring of funds</b>               | Funds allocated for selective collection “disappear” in the general operating budget.                              |
| <b>Lack of operational flexibility</b> | Bureaucratic structures do not respond efficiently to market changes or local problems.                            |
| <b>Restriction of innovation</b>       | Lack of incentives for the development of new services, education, or processing technologies.                     |
| <b>Weak stakeholder motivation</b>     | Producers, consumers, and local operators lose influence over the system and motivation for shared responsibility. |

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„The main benefit of working with PROs is the ability to build a strategy for the entire year. Contracts eliminate the uncertainty associated with the cost side of running a business. Thanks to contracts, it is possible to track the market situation from the level of waste group data entry and predict the potential for the coming months. Another aspect is fixed and clearly defined rules of the game, whereby plants can adopt a specific action strategy.”

**Sebastian Królik**, President of the Management Board of Terra Recycling, Elemental Group

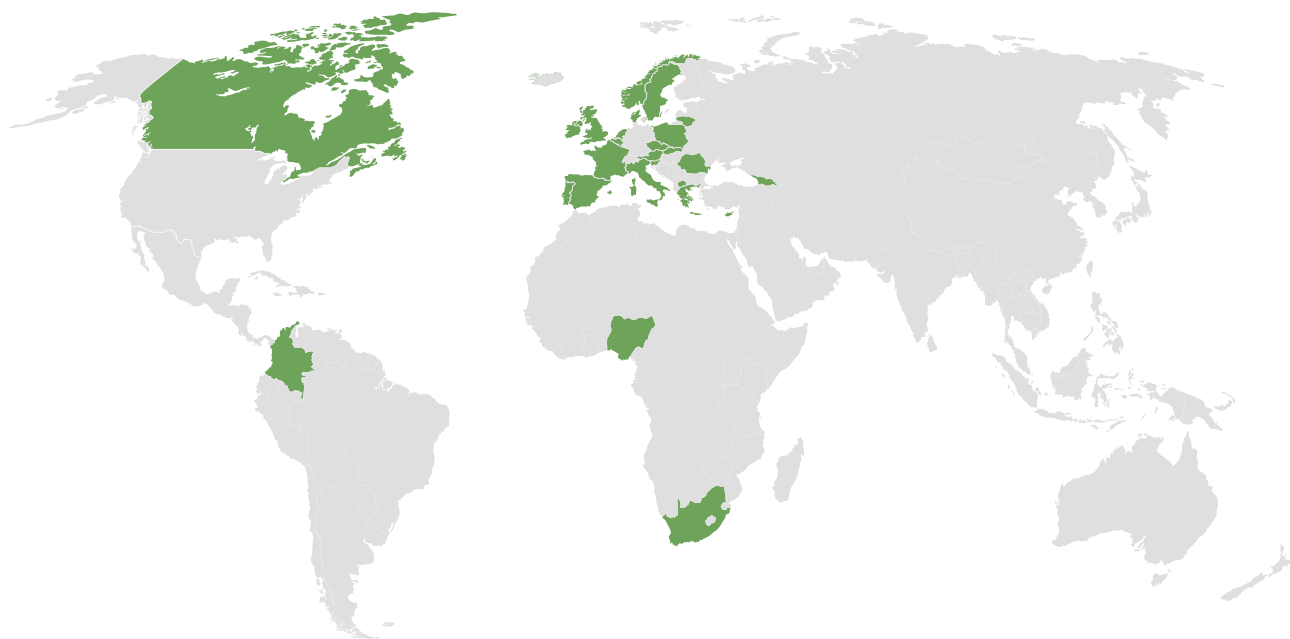
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## WEEE Forum – structure, role, and impact

The **WEEE Forum** is the world’s largest organization of **producer responsibility organizations (PROs)** involved in the management of waste electrical and electronic equipment (WEEE Forum 2019a). Founded in **April 2002**, the Forum currently brings together **51 organizations from 33 countries (WEEE Forum 2025a)** on all continents. Membership in the Forum requires meeting specific operational and ethical criteria, regardless of the national legal model.

The WEEE Forum includes PROs that collectively represent more than **46,000 electrical and electronic equipment producers** and have been implementing the principle of **extended producer responsibility in practice for over two decades**. In 2023, WEEE Forum member PROs were responsible for 60% of all WEEE collected in Europe (**WEEE Forum 2025b**).

## MEMBERS OF WEEE FORUM 2025



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Chart 3. Countries where WEEE Forum members operate

### WEEE Forum member organizations:

- Austria – UFH;
- Belgium – Recupel;
- Bosnia and Herzegovina – ZEOS;
- Cyprus – WEEE Cyprus;
- Czech Republic – Elektrowin;
- Denmark – Elretur, Recipo;
- France – Ecologic, Ecosystem, Soren;
- Greece – Appliances Recycling SA (Electrocycle), Fotokiklosi;
- Georgia – Wasteless;
- Ireland – WEEE Ireland;
- Iceland – IRF (Urvinnslusjodur);
- Canada – EPRA, GoRecycle, MARR;
- Colombia – EcoCómputo, Red Verde;
- Lithuania – EGIO, EPA;
- Luxembourg – Ecotrel;
- Malta – GreenPak, WEEE Malta;
- Moldova – MoldControl;
- Nigeria – EPRON;
- Netherlands – Stichting OPEN;
- Norway – Norsirk, Recipo, Renas;
- Poland – ElektroEko;
- Portugal – Electrão;
- Romania – ARCwaste, ECOTIC, ECT, Environ;
- Slovakia – ENVIDOM;
- Slovenia – ZEOS;
- Switzerland – SENS, SWICO;
- Sweden – El-Kretsen, Recipo;
- UK – Ecogenesys (formerly REPIC), PV Cycle;
- Italy – Cobat, Erion WEEE, PV Cycle

The mission of the WEEE Forum is to be a **global center of expertise on e-waste** and a leader in implementing the circular economy in the electrical and electronic sector (WEEE Forum 2019a). The organization actively promotes high quality standards, technological innovation, and process transparency. Thanks to their combined technical, operational, and business expertise, Forum members create effective and efficient systems for the collection, recycling, and preparation for reuse of equipment.

Since its inception, member organizations **have collected over 41.6 million tons of e-waste**, making the WEEE Forum the undisputed leader in this area of waste management in Europe and worldwide (**WEEE Forum 2025b**).

As an organization with over 20 years of experience, the Forum strives to:

- develop modern eco-modulation models and EPR systems,
- strengthen the role of secondary raw materials and critical raw materials,
- ensure full transparency and consistency of WEEE EPR scheme at EU and global levels.

The WEEE Forum promotes an all-actors approach, engaging producers, retailers, collectors, and treatment operators in efforts to improve WEEE collection and recycling. The organization participates in European Commission consultations and plays an active role in setting environmental goals at the EU level. As the only Polish member of the Forum, ElektroEko plays an important role in promoting high standards of transparency and efficiency in Poland.

*In view of dynamic technological and legislative changes, the WEEE Forum remains one of the most important voices in the European and global debate on e-waste.*

## Knowledge sharing and standard improvement

The WEEE Forum plays a key role as a **platform for the exchange of best practices** and a source of knowledge for its members and policy makers. Every quarter, representatives of member organizations meet to discuss challenges, trends, and legislative changes (WEEE Forum 2019a). The Forum has numerous **working groups and task forces** that deal with, among other things:

- the recycling of critical raw materials (CRM),
- harmonization of methodologies for calculating CO<sub>2</sub> emission reductions associated with WEEE treatment and recycling,
- management of photovoltaic panel streams,
- counteracting illegal exports and abandonment of e-waste.

As part of the **WEEELABEX** project, the WEEE Forum co-created and implemented the **EN 50625** standards, which are recognized in Europe and define the standards for the collection, logistics, and treatment of WEEE (WEEE Forum 2019a). The Forum is also involved in the development of innovative digital tools, such as:

- **WF-RepTool** – for monitoring and reporting treatment operations,
- **LibraWEEE** and **WEEE Directory** – analytical and market platforms,
- **I4R Platform** – in collaboration with APPLiA and DIGITALEUROPE, providing information on hazardous substances in products.

## Impact on European and international policy

The WEEE Forum has been actively involved in shaping European policy on WEEE and the circular economy for many years. It co-creates positions, recommendations, and reports aimed at:

- reforming the WEEE Directive, including moving away from the current collection rate based on the weight of equipment placed on the market,



- implementing a *multi-target framework* that, in addition to collection weight, also takes into account reuse rates, recycling of critical raw materials, and public awareness levels,
- promoting an *all-actors* approach, according to which responsibility for the scheme should not rest solely with producers, but with all participants in the value chain: trade, local governments, recyclers, consumers, and administration (WEEE Forum 2025b).

## Education and International e-Waste Day

As part of its educational activities, the WEEE Forum has been organizing **the International e-Waste Day** since 2018, celebrated on October 14. In 2024, over **70 countries** took part in the campaign. In 2025, **critical raw materials (CRMs)** and their importance for Europe's digital and energy transition became a key topic (ElektroEko 2025a).

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"Global educational initiatives, such as the International E-Waste Day created by the WEEE Forum, are an excellent opportunity to involve local communities in the global movement for responsible e-waste management. Thus educational activities in Poland become part of a larger, global narrative, and consumers can feel that their individual choices matter."

**Maria Andrzejewska**, Director of UNEP GRID-Warsaw

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## Summary – key findings from the analysis of WEEE EPR scheme in Europe

Waste electrical and electronic equipment management systems in Europe have undergone a dynamic evolution over the past two decades, from local and fragmented solutions to an increasingly coherent and harmonized legal framework based on the principle of **extended producer responsibility**.

Despite the common legislative basis provided by the WEEE Directive, WEEE collection and treatment systems in Member States differ significantly in terms of:

- organizational structure and number of PROs,
- level of collection efficiency,
- approach to recycling critical raw materials,
- scale of involvement in education and public awareness building.

At the same time, an analysis of European solutions reveals several **common features** of highly effective systems:

- **pursuit of transparency** in reporting and financing,
- **separation of the functions** of PROs from WEEE treatment activities,
- **coordination mechanisms** ensuring a fair distribution of responsibilities,
- **commitment to education** and public awareness building.

Of particular interest are the *clearing house* mechanisms in Germany and France, *mandatory handover* in France, and the *all actors* approach in Switzerland and the Netherlands. Scale of involvement in education and public awareness building. All these solutions show that the effectiveness of the WEEE EPR scheme does not depend

solely on the legal form of the organization, but above all on the **quality of operational mechanisms** and **the level of trust** between participants.

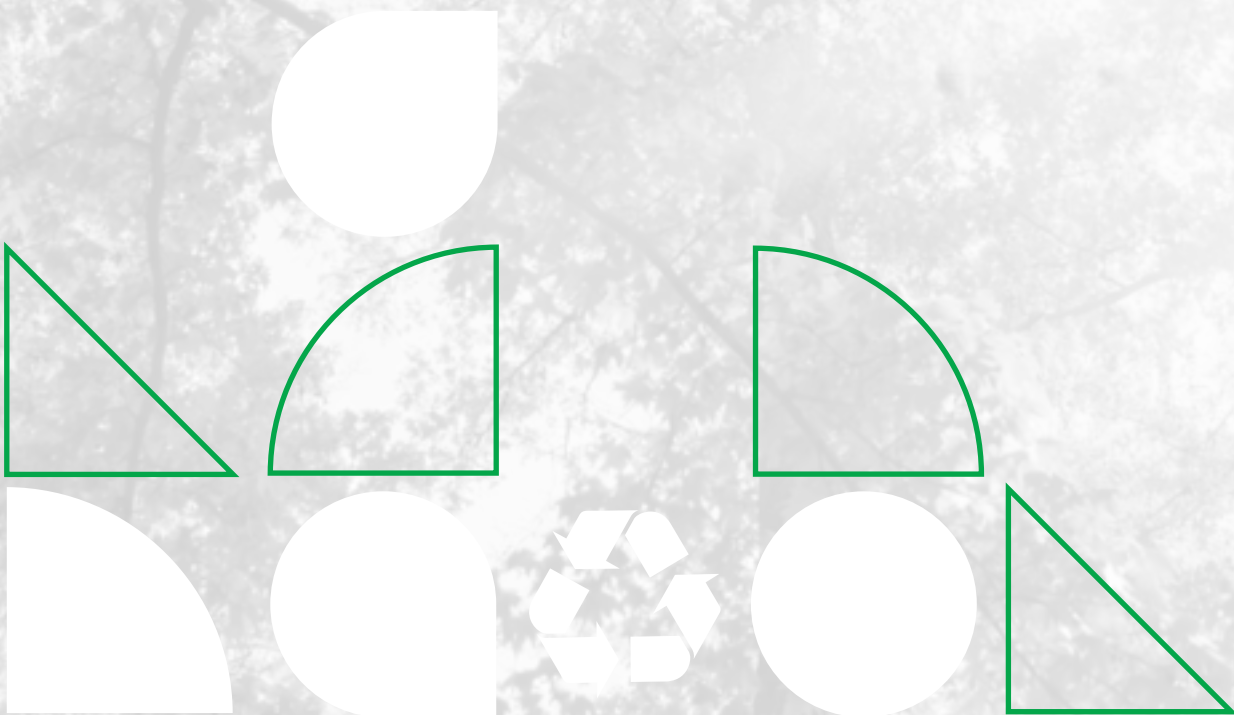
*A common challenge remains the insufficient collection rates in many countries and the growing importance of the **circular economy** and recycling of strategic raw materials essential for the EU's digital and energy transition.*

In this context, the **WEEE Forum** plays a key role as a platform for knowledge sharing, promoting the highest standards, and shaping the future of WEEE EPR schemes at the European and global levels. Membership in this organization is becoming a kind of **quality certificate** for PROs, signaling adherence to the highest standards of transparency and efficiency.

**The key question is: how does the Polish WEEE EPR scheme fare in this context?** Do the solutions developed in Poland meet European standards? What are the strengths of the Polish model, and where do the biggest challenges lie?

In the next part of the report, we will take a closer look at the **Polish WEEE management system**, its specific features in the European context, and the achievements and challenges facing the Polish industry







# 2 POLAND'S WEEE EPR SCHEME COMPARED TO EUROPE



## European background of the WEEE EPR scheme in Poland

There are several dominant models of waste electrical and electronic equipment (WEEE) (Deloitte and WEEE Forum 2025) recovery systems in Europe, which differ in terms of the level of centralization, state involvement, and mechanisms for ensuring transparency and efficiency.

Countries such as France, Norway, and Italy use systems with central (**but not state**) coordination and mandatory participation of producers, most often based on a not-for-profit model. One of the best-known systems of this type is the French system, with the *clearing house* (OCAD3E) (Légifrance 2014). In this system, participation by producers and importers is mandatory, and a central unit coordinates the activities of PROs, ensuring uniform standards and minimizing the possibility of systemic pathologies.

In Germany and Austria, systems with multiple PROs are preferred, supported by market competition but under strict government supervision. High levels of transparency and mandatory audits are crucial here, as they ensure stability and trust among market participants.

### KEY EUROPEAN STANDARDS:

- *Not-for-profit* as the standard for WEEE Forum membership.
- Common quality certificates: WEEELABEX, EN 50625 (WEEELABEX and WEEE Forum 2019).
- *Multi-target framework*: collection, CRM, education, preparation for reuse (Deloitte and WEEE Forum 2025)

In Central and Eastern Europe, including Poland, national regulations and models for organizing WEEE EPR schemes have been shaped by local legal, economic, and political realities.

*As a result, a commercial model was adopted which, despite formally complying with environmental objectives, results in less transparency and weaker supervision compared to the solutions adopted in Western Europe.*

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“Trust is built through many years of cooperation. We must be sure that the equipment will be collected and properly treated. It is important that the PRO has the knowledge and experience regarding the method of recovery and the technologies that will allow for the recovery of as many raw materials as possible. For us as a producer, cooperation with a reliable partner is a responsibility.”

**Piotr Stelmachów**, VP, Head of Consumer Electronics at Samsung Electronics Polska

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### POSTPONED DEADLINES AND LEGAL CONTROVERSIES

It is worth recalling that for some of the new Member States, including Poland, the original deadlines for achieving the required collection levels were postponed to allow them to adapt to the new requirements and build the appropriate systemic structures (Polish Press Agency 2015). This was due to both lower environmental awareness and a lack of existing infrastructure.



During the legislative work on the WEEE Act in Poland, some legal circles, including the Legislative Office of the Polish Parliament, pointed out that the introduction of the *not-for-profit* principle for PROs could be contrary to the constitutional principle of freedom of economic activity (Polish Press Agency 2015).

This approach had significant consequences for the functioning of the system. A trend of weakening its stability and transparency became entrenched, as evidenced, among other things, by the reduction in real funds allocated to educational activities and massive dividend payments by PROs. According to financial data available in the National Court Register, between 2006 and 2024, PROs paid out approximately PLN 205 million in profits to their owners (Ministry of Finance 2025).

*The lack of control tools and insufficient implementing regulations meant that, even in the early stages, problems arose in the form of the so-called gray market, manifested, among other things, in the reporting of fictitious collection volumes and a lack of real supervision over treatment plants (IBnGR 2010, 26–29).*

A 2010 report by the Institute for Market Economics confirmed this diagnosis: The system in its current form is partly superficial—it does not ensure that environmental goals are actually achieved, but focuses on fulfilling formal reporting obligations (IBnGR 2010, 26). Among other things, analysts pointed to the lack of interest on the part of PROs in actual collection – the phenomenon of *compliance minimalism* prevailed.

## The history of WEEE legislation in Poland and its impact on the current system model

The Polish system for managing waste electrical and electronic equipment was developed in response to EU regulations, the implementation of which was spread over many years and repeatedly criticized for its slow pace, legal loopholes, and lack of transparency. Below is a chronological overview of key legal changes, along with references to their impact on the current system model.

### 2003–2005: TRANSPOSITION OF THE WEEE DIRECTIVE AND THE FIRST ACT

In January 2003, the EU adopted Directive 2002/96/EC (European Parliament 2003) on WEEE, obliging Member States to transpose it by August 2005. As a new EU member, Poland was given additional time to implement its visions.

The first WEEE Act was passed on July 29, 2005 (Journal of Laws of 2005, No. 180, item 1495) and entered into force on October 21, 2005. (Dz. U. z 2005 r. Nr 180 poz. 1495). The act laid the foundations for an extended producer responsibility (EPR) system, defined collection, treatment, and education obligations, and introduced minimum collection levels (4 kg/capita per year from 2008).

### 2008–2009: FIRST AMENDMENT AND THE EXTENSION OF LIABILITY

The amendment to the Act of November 21, 2008 (Journal of Laws No. 223, item 1464) came into force on January 1, 2009, and was a response to the growing scale of abuse. New obligations and sanctions were introduced, including:

- collection levels expressed as a percentage of the POM weight,
- new penalties (up to PLN 100,000 for illegal dismantling),
- fines for disposing of equipment in municipal waste.

## 2012: THE NEW WEEE DIRECTIVE AND THE NEED FOR CHANGE

On July 4, 2012, Directive 2012/19/EU (European Parliament and Council (EU) 2012) was adopted, repealing the previous directive and introducing new requirements, including: a new division into six groups of equipment, increased recycling levels, an expanded scope of equipment, an obligation for distributors to collect waste, and harmonization of registers (Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE)).

The transposition should have taken place by February 14, 2014, but Poland did not adopt the new regulations until 2015.

## 2015–2016: NEW LAW AND REFORM ATTEMPT

On September 11, 2015, a new law on WEEE (Journal of Laws of 2015, item 1688) was passed, which came into force on January 1, 2016 (Journal of Laws 2015, item 1688).

This act:

- introduced a division into six groups of equipment,
- raised collection levels to 65% of equipment placed on the market (POM) or 85% of WEEE generated,
- tightened controls, introduced the obligation to conduct educational campaigns,
- regulated the dismantling of equipment, and counteracted the illegal collection of incomplete waste equipment.

At the same time, however, a model was chosen that perpetuated the functioning of joint-stock companies as PROs, which distinguished Poland from most EU countries based on the not-for-profit (Polish Press Agency 2015) principle.

## 2017: IMPLEMENTING REGULATIONS AND SUPREME AUDIT OFFICE REPORT

On July 21, 2017, the Minister of the Environment issued a regulation specifying minimum collection levels for individual groups of equipment. (Journal of Laws 2017, item 1499)

In the same year, the Supreme Audit Office published a report (Supreme Audit Office 2017), which pointed to:

- the lack of a real control,
- the low effectiveness of supervision by the Environmental Protection Inspectorate,
- the risk of fictitious collection masses,
- lack of updates to control procedures since 2010.

*The management of waste electrical and electronic equipment in Poland is riddled with irregularities. There are no processing standards, and the reporting system is not a source of reliable and credible data for the market (Supreme Audit Office 2017).*

The current situation requires a decisive overhaul of the system, including the implementation of effective supervision mechanisms, transparency, and the not-for-profit principle as the basis for the operation of PROs.

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“In the light of the experiences of European EPR systems, we recommend maintaining organizational pluralism and enabling competition between organizations, which promotes the effective use of funds and innovation. The optimal model is a system managed in partnership with organizations created by entrepreneurs, while maintaining mechanisms of competition and transparency.”

**Piotr Mazurek**, expert of Konfederacja Lewiatan

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## An overview of the Polish market

### STRUCTURE OF THE CURRENT SYSTEM IN POLAND AND ITS PARTICIPANTS

The Polish system for managing waste electrical and electronic equipment is based on a three-tier operational structure, in which the main actors are: equipment manufacturers and importers (producers), PROs, and treatment facilities. Supervisory and administrative institutions, including the Chief Inspectorate for Environmental Protection (GIOŚ) and Regional Inspectorates for Environmental Protection (WIOŚ), as well as marshal’s offices, also participate in the system (Journal of Laws 2015, item 1688).

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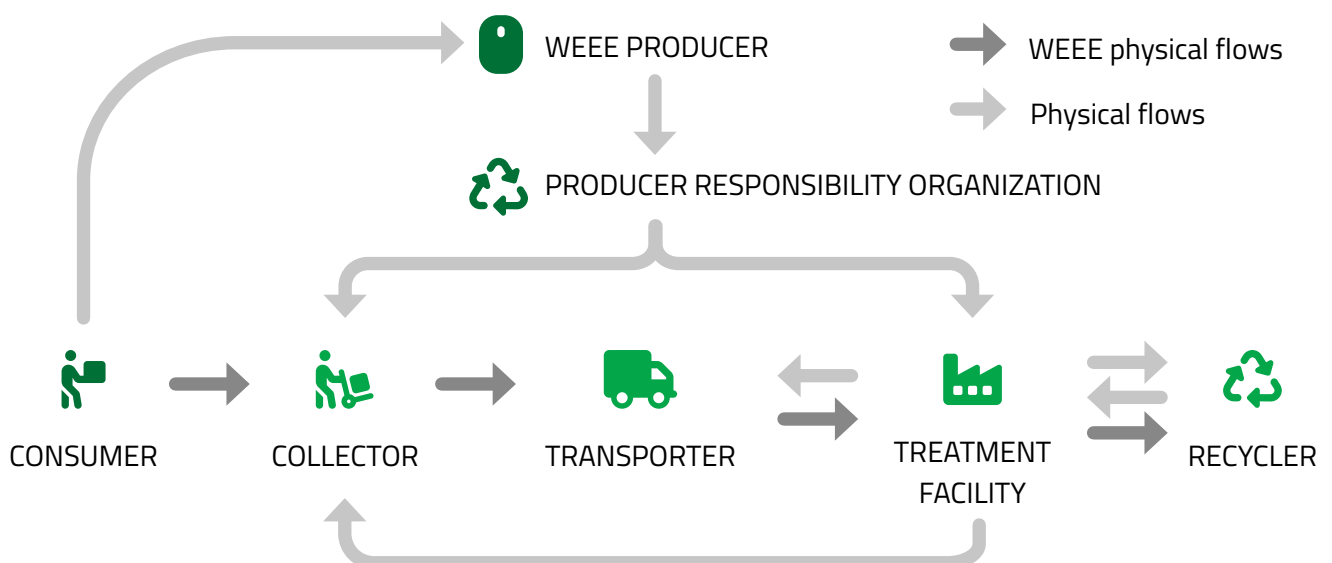
“Producers should have an influence on the supervision of the WEEE management system, as they are formally and financially responsible for the fulfillment of obligations. Their involvement can contribute to greater transparency, efficiency, and better adaptation of the system to market realities. This influence can be exercised through participation in legislative consultations, presence on the supervisory boards of PROs, or cooperation with the administration in developing standards.”

**Marek Maksymiuk**, BSH Polska

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Figure 1. Operation of the WEEE collection system in Poland (IBnGR, 2010)

### OPERATION OF THE WEEE COLLECTION SYSTEM IN POLAND



Source: Report of IBnGR Operation and irregularities of the WEEE management system in Poland, March 2010

According to data contained in Section IV of the registration application in the Database on Products, Packaging, and Waste Management, there are over 13,000 entities involved in the management of electrical and electronic equipment in Poland. Among them were 12 electrical and electronic equipment PROs, 141 entities operating in the field of recycling, 115 WEEE treatment plants, 11,494 producers placing equipment on the market or acting as authorized representatives, and 1,412 entities involved in the collection of waste equipment (2025).

## EQUIPMENT PRODUCER – ROLE, RESPONSIBILITIES, AND CHALLENGES

The Act of September 11, 2015 (Journal of Laws of 2024, item 573), hereinafter referred to as the WEEE Act, (Journal of Laws 2015, item 1688) defines the concept of producers of electrical and electronic equipment and equipment manufacturers. The producers include manufacturers, importers, and distributors who place equipment on the Polish market, regardless of the sales channel (including online) or registered seat. In accordance with the principles of extended producer responsibility, they are responsible for financing and organizing a system for the collection, treatment, and recycling of waste electrical and electronic equipment (WEEE).

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“Producers bear financial and reputational responsibility for the functioning of the system, so they should be able to control its effectiveness. This influence can be exercised by co-creating legislation and market supervision rules, as well as by obliging PROs to implement internal control and monitoring mechanisms for contractors.”

**Zygmunt Łopalewski**, Beko Central Europe

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Producers may fulfill their obligations independently or – which is the prevailing practice – transfer them to PROs on a contractual basis. Regardless of the form of implementation, **full responsibility for fulfilling obligations remains with the producer.**

The main obligations of producers in the field of WEEE include:

- **financing the collection and processing of WEEE,**
- **achieving statutory collection, recovery, and recycling levels** in accordance with EU requirements and national regulations,
- **conducting or financing educational campaigns** – if this obligation is fulfilled independently, the producer must allocate a minimum of **0.1% of the net revenue from the sale of equipment in the previous year for this purpose.** Alternatively, they may transfer this amount to the account of the marshal's office,
- **registration with the Waste Database and reporting** – including information on the equipment introduced and the degree of fulfillment of environmental obligations,
- **labeling equipment** and providing users with information on how to handle e-waste, as well as providing treatment plants with information on the technical composition of products.

In the case of foreign manufacturers who do not have a registered office in Poland, the Act provides for the possibility (or obligation, depending on the sales model) of appointing an **authorized representative** based in Poland. Such a representative acts on behalf of and for the benefit of the manufacturer, assuming its obligations towards the Polish EPR system. This is particularly important in the context of rapidly growing sales of equipment by foreign e-commerce platforms.

Although the obligations are clearly defined by law, in practice their implementation may encounter difficulties, especially with regard to new market players, companies operating from abroad, or digital platforms.

*Another challenge is the lack of effective control tools that would allow for quick verification of whether a given producer actually fulfills its obligations towards the WEEE EPR scheme.*

## PROs – ROLE, STRUCTURE, AND SYSTEMIC CHALLENGES

WEEE Producer Responsibility Organizations play a key operational role in the Polish WEEE EPR scheme – they take over the responsibilities of producers related to collection, processing, recycling, and environmental education. Their task is to organize and finance the activities necessary to implement extended producer responsibility.

Pursuant to Article 60 of the WEEE Act (2015), the PRO of electrical and electronic equipment may only be established by:

- equipment producers and manufacturers,
- employers' associations or chambers of commerce representing them.

The PRO must take the form of a joint-stock company and meet additional requirements, including:

- having a share capital of at least PLN 5 million,
- obtaining an entry in the Waste Database register,
- implementing an environmental management system (EMAS or ISO 14001),
- undergo an annual external audit conducted by an accredited environmental verifier.

**The most important responsibilities of a PRO include:**

- **fulfilling environmental obligations on behalf of producers** – under the WEEE compliance scheme agreement, it assumes obligations for a specified amount of equipment placed on the market,
- **entering into agreements with treatment facilities** – the organization must ensure the physical collection and treatment of WEEE by signing contracts with appropriately equipped facilities,
- **conducting public education campaigns** – WEEE compliance scheme are required to allocate at least 5% of net revenues from assumed environmental obligations to educational activities (Journal of Laws 2015, item 1688, art. 62 section 2). The amount and use of these funds are subject to settlement and control by marshal's offices.
- **external audit** – each organization must conduct an annual independent environmental audit, the scope of which includes, among other things, verification of contracts with treatment plants and the achievement of collection levels.
- **reporting and registration** – WEEE compliance scheme must be entered in the Waste Database and submit detailed annual reports on their activities, including data on collection, processing, educational campaigns, and recycling levels achieved.

## Ownership structure of PROs and market problems

Although the legislator has stipulated that PROs should represent the interests of producers, many of these organizations were established by treatment plants or other entities that are not involved in placing equipment on the Polish market.

*According to industry data, **more than half of the active WEEE compliance scheme in Poland have capital or operational links with treatment plants**, which creates a risk of conflict of interest and undermines the principle of independence (InfoProdukt 2025d).*

Such a structure may lead to a situation in which the PRO, instead of acting on behalf of producers and importers, in practice pursues the interests of WEEE treatment plants, e.g. by limiting cost control, directing waste streams to its “own” facilities, or influencing the choice of processing technology (Executive Magazine 2025b).

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„Producers expect PROs to comply with the EPR philosophy and the WEEE Directive – full implementation of environmental obligations on behalf of the manufacturer, financial and operational transparency – including cost transparency, independence from treatment plants, and reliable reporting of masses and recovery levels. Decision to choose the PRO depends on its legal status, operating model, and effectiveness in fulfilling its obligations.”

**Tomasz Książek, Signify Poland and Baltic States**

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In accordance with the best European practices (e.g. in France, Belgium, Norway), PROs should be fully independent from WEEE treatment facilities. However, these practices are not widely used in Poland. The status of shareholders of PROs is also not subject to periodic verification, and there are situations where a natural person is a shareholder.

## Treatment facilities – operational role, technical requirements, and supervision

Treatment facilities are a key link in the chain of responsibility in the waste electrical and electronic equipment management system. They are responsible for the physical treatment of e-waste, its dismantling, and preparation for reuse.

*It is the activities of treatment facilities that largely determine the effectiveness of the system in terms of environmental protection and resource recovery. For this reason, the plants are supervised by the Environmental Protection Inspectorate and Marshal's Offices, and are inspected by an accredited environmental reviewer. In addition, they should be audited by PROs.*

In order to legally operate in this area, an entity must obtain an administrative decision authorizing the treatment of waste equipment and be entered into the Waste Database. Pursuant to the WEEE Directive (2015), treatment includes not only dismantling, but also the removal of hazardous substances, the separation of materials, and preparation for recycling or reuse.

Specialized entities – recyclers and disposal operators – are responsible for recycling and disposal activities. They provide information on the masses of disposed waste to treatment plants. Those, in turn, are responsible for further reporting the data to PROs or producers.

### THE MAIN RESPONSIBILITIES OF TREATMENT FACILITIES INCLUDE:

- **Take-back of WEEE:** the facility is required to accept large equipment (any external dimension more than 50 cm), including free collection from collectors of waste equipment from households.
- **Treatment in accordance with best practices:** the facilities must ensure the removal of all liquids and conduct selective treatment in accordance with the requirements of Annex 5 to the Act. Standards based on best available techniques (BAT) apply here, most often in accordance with the CENELEC PN-EN 50625 standard (CENELEC 2017).



- **Provision of technical infrastructure:** the plant must be equipped with a roof, impermeable flooring, security measures to prevent access by third parties, and certified weighing equipment. Appropriate infrastructure for the storage of hazardous components and items intended for reuse is also required.
- **Recycling outside the country:** waste generated as a result of treatment may be exported to foreign facilities, provided that they meet equivalent environmental and technical standards.
- **Certificates and reporting:** facilities issue official documents confirming the weight of collected, treatment, recovered, and recycled waste equipment – both for their own reporting purposes and for those of importers and PROs. These documents form the basis for calculating the achieved levels of collection of waste equipment and recovery and recycling of waste from the treatment of waste equipment.
- **External audit:** each year, the plant must undergo an environmental audit conducted by an accredited environmental verifier. The aim is to verify the compliance of the declared data with the actual course of the processes, as well as to assess the quality of treatment in accordance with legal requirements.

## SYSTEMIC PROBLEMS AND INSTITUTIONAL DEPENDENCIES

*In the Polish WEEE EPR scheme, there are strong capital links between some treatment facilities and PROs – they are often part of the same capital group and are usually the owners of these organizations. This can lead to reduced competition and transparency.*

This also increases the risk of conflicts of interest in the management of WEEE streams and the calculation of treatment costs (Supreme Audit Office 2017; WEEE Forum 2020). Lack of an independent clearing house further hinders the effective control of waste flows, documentation, and money between PROs and treatment facilities, as confirmed by both audits by the Supreme Audit Office (2017; 2022; 2025), and analyses by the European Commission.

## Supervision and public administration

The Ministry of Climate and Environment coordinates the Waste Database system, and marshal's offices perform key administrative functions. Despite digitization and mandatory registration in the Waste Database, there is still a problem of incomplete traceability of waste streams, especially in the case of equipment collected by unauthorized entities or removed from the system (Journal of Laws 2023, item 1587).

Marshal's offices receive and verify reports from equipment importers and PROs. In the event of non-compliance, they conduct administrative proceedings and impose a product fee for failure to achieve the required collection, recovery, or recycling levels. The fee covers the costs of unfulfilled environmental obligations. (Journal of Laws 2015, item 1688).

The Regional Inspectorate for Environmental Protection (WIOŚ) and the Chief Inspectorate for Environmental Protection (GIOŚ) supervise the WEEE EPR scheme. The WIOŚ imposes penalties for violations of the WEEE Act, and the GIOŚ considers appeals against WIOŚ decisions. In most cases, administrative fines for violations of the WEEE Act are imposed by these inspectorates.

The **2017 report of the Supreme Audit Office** indicates, among other things, that in 2013-2015, the Environmental Protection Inspectorate inspected only **3.7% of WEEE collection entities**, and the reporting system did not ensure consistency between the declared and actual weight of processed equipment (Supreme Audit Office 2017). In the opinion of the Supreme Audit Office, the lack of uniform control guidelines and the dispersion of responsibility between the Chief Inspectorate for Environmental Protection and provincial marshals had a negative impact on the effectiveness of the entire system.

## Current data and collection levels

Poland, as one of the largest markets for electrical and electronic equipment in Central and Eastern Europe, has a well-developed WEEE collection network. According to data from the Ministry of Climate and Environment (2024) in 2023:

- the mass of electrical and electronic equipment placed on the market amounted to approximately **996,500 tons**, and approximately **779,100 tons** formed the basis for calculating current collection levels,
- the mass of electrical and electronic equipment collected by WEEE collectors amounted to approximately **533,200 tons**,
- while the collection gap (the difference between POM and WEEE collected) amounted to over **405,000 tons**.

## WEIGHT OF EQUIPMENT PLACED ON THE MARKET IN POLAND 2018-2023, TONS

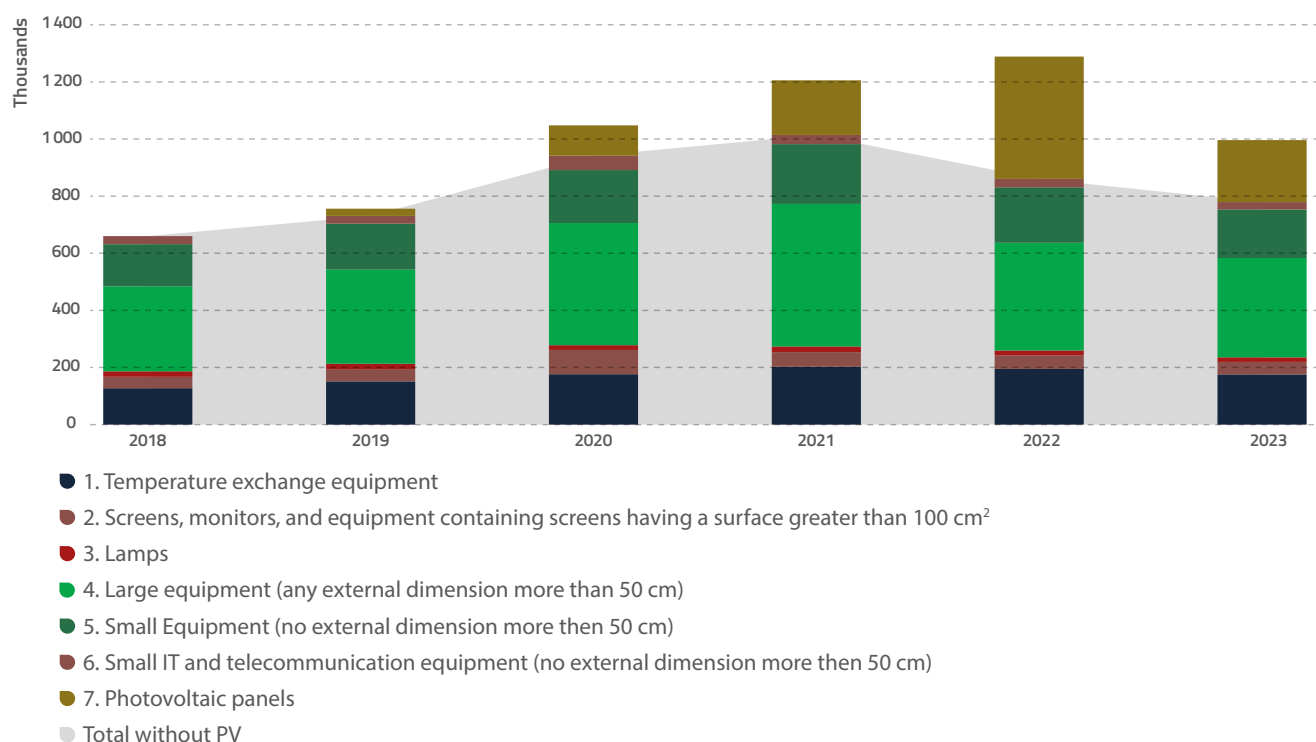


Chart 4. POM mass in Poland 2018–2023, tons; data from the Ministry of Climate and Environment, ElektroEko

In the structure of equipment placed (POM) in 2023 the following categories predominated:

- **large equipment** – 347,600 tons,
- **refrigeration equipment (group 1)** – 175,800 tons,
- **small household appliances/audio-video equipment** – 170,000 tons.

In the corresponding collection structure (WG), the largest volumes were recorded for:

- **large equipment** – 214,100 tons,
- **refrigeration equipment** – 117,500 tons,
- **small household appliances and audio/video equipment** – 124,500 tons.

The differences between the POM structure and the collection structure are significant. Data from WEEE Forum benchmarks (2024) indicate that Poland collects relatively considerable amounts of large equipment, but still has a low collection rate for small electronics and lamps.

## MASS OF COLLECTED WEEE IN POLAND 2018-2023, IN TONS

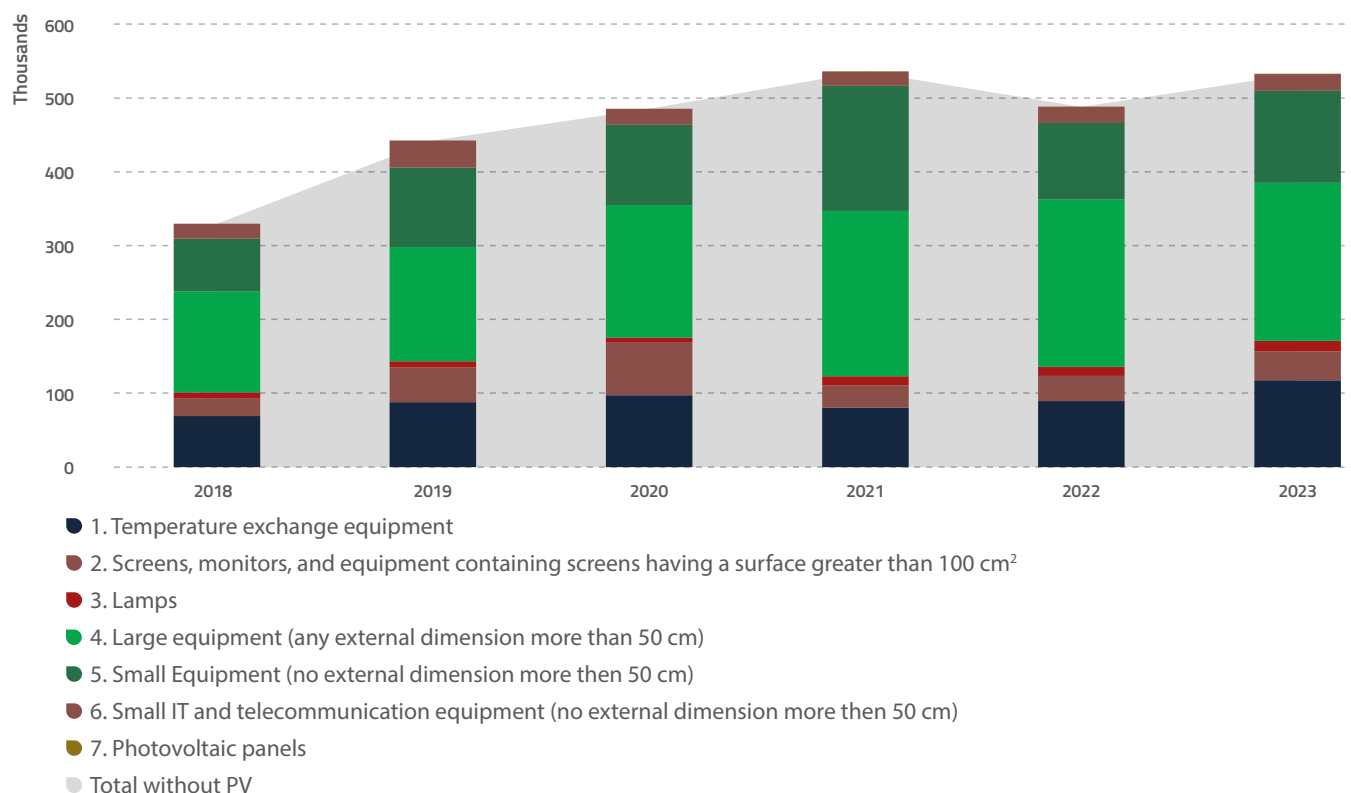


Chart 5. Mass of collected waste electrical and electronic equipment in Poland 2018–2023, in tons; data from the Ministry of Climate and Environment, ElektroEko

The informational value of the data discussed increases when compared with indicators from other countries. The EU average for WEEE collection in 2022 was 11.2 kg/capita, while Poland achieved 14.6 kg/capita (Baldé et al. 2024; WEEE Forum 2025c; Eurostat 2024b).

Although the collection rate per capita (14.6 kg/capita) places Poland above the EU average (11.2 kg/capita), the key measure of the system's effectiveness is the formal target set by the WEEE Directive. Since 2019, this target has been 65% of the average POM weight in the previous three years. For Poland, the target for 2022, calculated on the basis of POM data from 2019–2021, was 17.5 kg/capita. The achieved level of 14.6 kg/capita means that Poland, like most EU countries, has not met the target.

This discrepancy does not indicate a failure of the collection system, but highlights a systemic flaw in the POM methodology itself, which does not take into account growing sales and the long life cycle of products. Paradoxically, the more dynamically the market grows (which is a positive phenomenon), the more difficult it is to achieve a collection target based on historical sales.

## WEEE COLLECTION LEVEL IN POLAND VS. TARGET BASED ON POM (2016–2022)

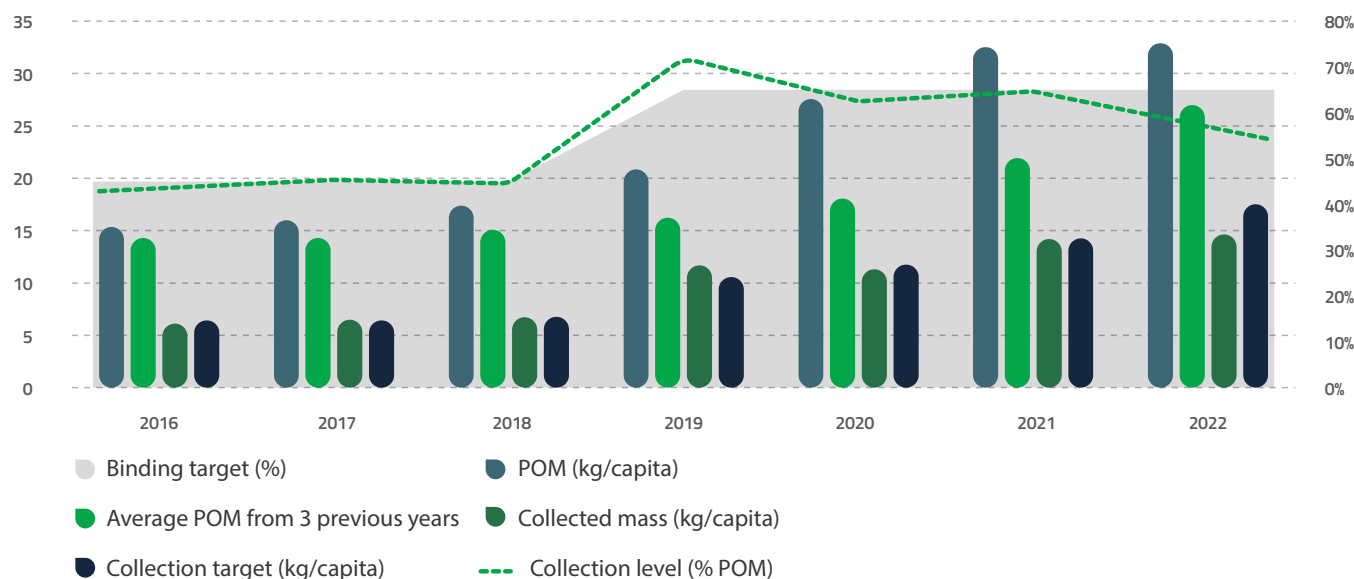


Chart 6. WEEE collection rate in Poland vs. target based on POM (2016–2022); data: Eurostat

In July 2025, the European Commission proposed introducing a new mechanism for financing the EU budget in the form of a uniform rate on non-collected e-waste. The fee – estimated at €15 billion per year (€2 for every kilogram of WEEE that does not enter the collection and treatment system) – is intended to be not only fiscal but also motivational. The aim is to put pressure on countries where collection efficiency does not exceed the set levels, including Poland (European Commission 2025d).

## Long-term trends: collection and POM in Poland compared to Europe (2010–2023)

In 2010, Poland placed **12.8 kg/capita** of electrical and electronic equipment on the market, which represented **65% of the EU POM average**. Between 2020 and 2022, thanks to the consumption boom, this share increased to as much as 32.9 kg/capita (**106% of the EU average level**). However, in 2023, this trend reversed to **26.51 kg/capita**. This change can be partly attributed to economic fluctuations and the stabilization of the electronics and household appliances market after the pandemic (Eurostat 2022b).

### POM IN POLAND AND UE 2010-2023 (KG PER CAPITA) | WEEE FORUM

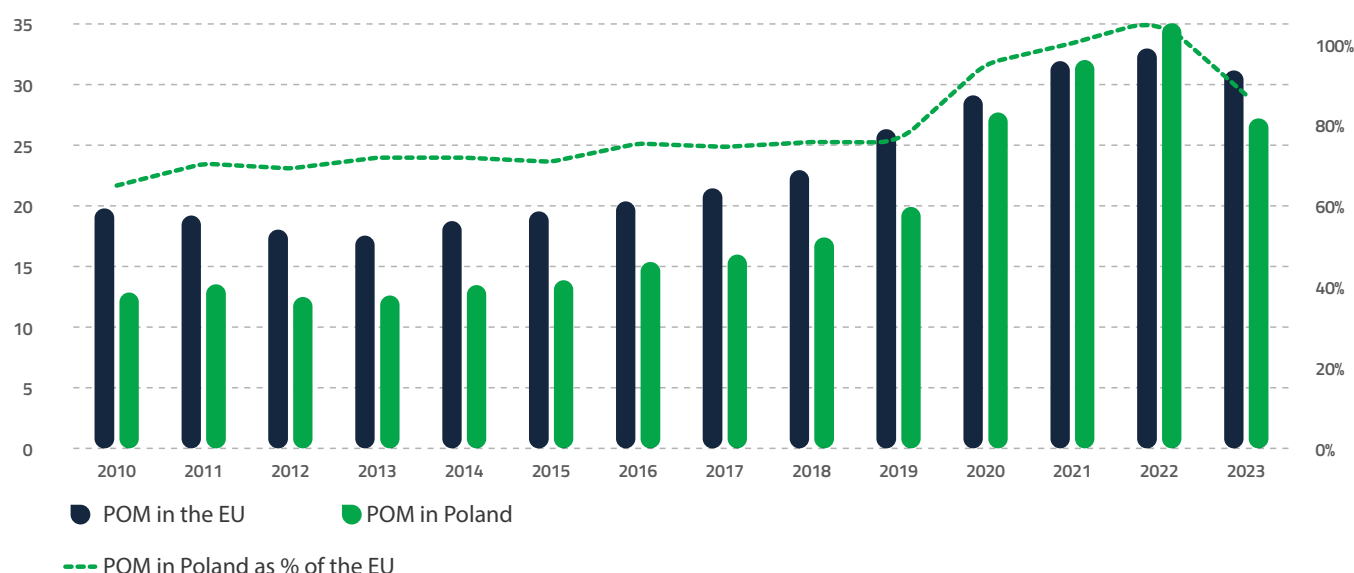


Chart 7. POM kg per capita, 2010–2023; data from WEEE Forum

Between 2010 and 2023, the WEEE collection system in Poland underwent a significant quantitative and structural transformation. In 2010, the collection rate was only **2.95 kg/capita**, which placed Poland far below the EU average (**6.9 kg/capita**) and at the bottom of the EU country table. By 2022, this rate had increased fivefold to **14.6 kg/capita** (EU average level: 11.2 kg per capita) (Eurostat 2025a).

## WEEE COLLECTION - POLISH AND EU TRENDS 2010-2023 (KG/CAPITA)

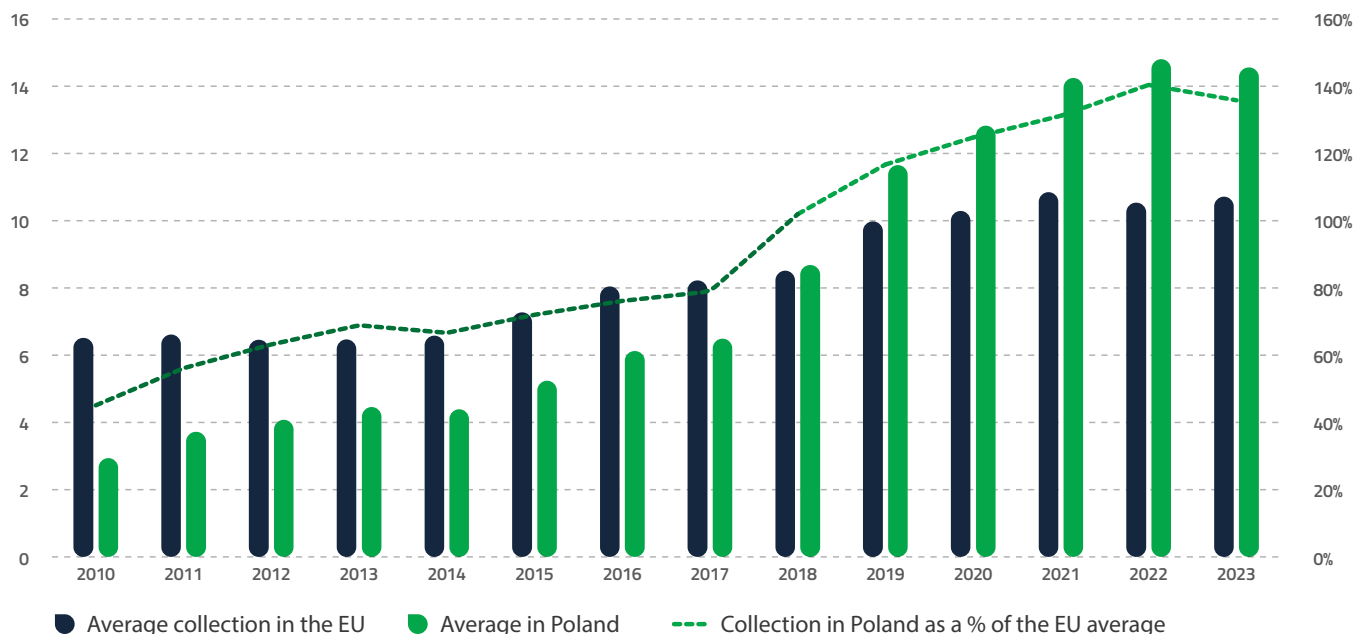


Chart 8. WEEE collection per person 2010–2023; data from WEEE Forum

This dynamic growth was achieved particularly after 2015, when the new WEEE Act was introduced, the activities of PROs and public administration were intensified, and entities placing equipment other than household equipment on the market were required to achieve appropriate collection levels. Between 2015 and 2023, the mass of WEEE collected increased from **199,000 tons** to **533,000 tons**, which corresponds to a **167% increase** over eight years (MKiŚ i ElektroEko 2024). However, it should not be forgotten that if we were to base our calculations on a model referring to the average product life cycle in Poland, this result would probably be impossible to achieve.

## Key findings from the long-term analysis

- The **collection rate in Poland (kg/capita)** increased from 2.95 kg in 2010 to 14.6 kg in 2023, which represents an almost fivefold increase over 13 years.
- The **POM indicator** tripled during this period (Eurostat 2022b), reflecting increasing consumption and shorter product life cycles.
- **Poland's share of the EU POM average** grew from 65% (2010) to 106% (2022), meaning that Poland has become one of the countries with the highest equipment consumption rates in the EU.

## Industry challenges

Compared to the rest of Europe, the extended producer responsibility mechanism for electrical and electronic equipment implemented in Poland is characterized by several significant structural challenges that have remained unresolved for years. One of these is certainly the lack of a modern and effective system that would

allow for real-time or near real-time analysis of waste management information, detection of anomalies, and creation of cross-sectional analyses for effective planning and pricing of services (Supreme Audit Office 2025).

*The lack of an effective monitoring system creates a risk of manipulation and the generation of artificial masses*

## MARKET CRISIS AND DISPROPORTIONATE OBLIGATIONS

A key systemic challenge is the fact that mandatory minimum collection targets under the POM methodology are based on average sales over the last three years, without taking into account periods of economic downturn. This results in a paradoxical situation of falling sales levels among producers, accompanied by an increase in their obligations (costs), additionally burdened by increases in equipment treatment rates. This trend is expected to continue at least until the end of 2027 (Teraz Środowisko 2023).

„The biggest challenge over the past two years has been the ever-changing, rising fixed costs associated with running a business – labor costs, maintenance of production lines, vehicle fleets, electricity and gas, and inflation. This has resulted in several price changes during the year, which puts price pressure on customers and forces managers to monitor the balance sheet more closely.”

**Sebastian Królik**, President of the Management Board of Terra Recycling, Elemental Group

However, the main barriers to achieving the set WEEE collection levels identified by *Global E-waste Monitor* (2024) are: mixing WEEE with scrap metal (2.1 kg/capita), disposal of equipment in mixed waste (1.4 kg), illegal export (0.5–1.4 kg), and accumulation of waste equipment in households (4–5 kg).

*In 2024, the European Commission (2024) initiated proceedings against all 27 Member States for failing to achieve WEEE collection targets.*

## EXCESSIVE PROCESSING CAPACITY OF TREATMENT FACILITIES

One of the most serious structural problems of the Polish WEEE EPR scheme is the drastic surplus of waste treatment capacity. The current treatment capacity in Poland exceeds one million tons per year, while the actual obligations may fall significantly below 500,000 tons (InfoProdukt 2025b).

This situation is caused by several factors:

- **enhancing process professionalism** – the market has evolved from manual dismantling to modern, professional e-waste treatment technologies, which has required significant financial outlays, such as investments in modern treatment lines,
- **decline in the mass of equipment placed on the market** – the number of new devices sold has fallen significantly,
- **risk of rapid change in the market situation** – there is now a significant surplus of production capacity, particularly evident in the case of technologies for treatment of refrigeration and air conditioning equipment,



- **the risk of a gray market** – treatment of waste equipment equipment without incurring actual costs, generating fictitious recycling certificates, and circumventing the control system; **when market obligations are decreasing and technological treatment capabilities are high, the temptation to enter the gray market increases significantly (Executive Magazine 2025a).**

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“Excess capacity in treatment plants is, in simple terms, a lack of full efficiency and a waste of opportunity. There are two ways this can happen: overestimated commercial assumptions or a sudden change in the market situation. Each of these leads to a situation where the plant must maintain production lines that generate fixed costs while keeping people in their jobs. The result is that revenue and cost policies are experiencing serious turbulence.”

**Sebastian Królik**, President of the Management Board of Terra Recycling, Elemental Group

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## The evolution of the gray market

Since the beginning of the WEEE industry, it has been overshadowed by the gray market. Although the methods of circumventing the law are changing, the goal remains the same: to maximize profits at the expense of environmental obligations. In the early years of the system’s operation in Poland, as well as throughout Europe, some of the waste equipment did not enter the official system.

Italian scientists analyzing the challenges the WEEE industry faces pointed to “significant leaks into informal or parallel streams that are not covered by records or environmental controls (Ghisellini et al. 2023).” The scale of this phenomenon lowers official collection rates and disrupts the functioning of the extended producer responsibility system.

*For Poland, this is an argument for maintaining the control function of PROs and continuing the mandatory transfer of WEEE to designated collection points and, ultimately, to treatment facilities, i.e., mandatory handover.*

The information on the audit by the Supreme Audit Office, (2022) *The functioning of the municipal and post-consumer waste management system and cross-border waste shipments*, describes the results of an expert opinion commissioned by the Chief Inspectorate for Environmental Protection, *Estimation of the size of the gray market in waste management and its impact on the state budget*, which showed a significant and increasing **share of the gray market in waste management**.

In 2016, it covered 7.8 million tons of various types of waste and translated into a market share of approximately PLN 2.7 billion. According to the data presented in the aforesaid study, in terms of value, the gray market was largest in municipal waste (PLN 1.2 billion), packaging and packaging waste (PLN 1.0 billion), and end-of-life vehicles (PLN 500 million). Estimates indicated PLN 200 million for waste electrical and electronic equipment and PLN 40 million for waste batteries and accumulators (Supreme Audit Office 2022, 18).

The authors pointed out the lack of a systematic control and enforcement system, which leads to the development of further large-scale pathologies, threatening the functioning of honest entrepreneurs and worsening their competitiveness.

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Earlier forms of pathology (until 2015)</b> | In the past, one of the main problems with the system was the issuance of fictitious documents confirming treatment of equipment, even though in reality no such treatment ever took place. Another significant abuse was the illegal collection of waste electrical and electronic equipment by scrap metal collection points, which did not treat it as hazardous waste, contrary to the regulations in force.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Contemporary systemic pathologies</b>       | <p>After the introduction of the Waste Database system in 2018, the situation improved somewhat, but at the same time new forms of abuse emerged. Currently, the most common pathological phenomenon is the unregistered collection of waste electrical and electronic equipment or the artificial overstatement of its volume.</p> <p>Capital links remain a key problem – treatment plants set up their own PROs, which limits the ability to control actual treatment process and may affect the way environmental obligations are fulfilled. As a result, significant funds are withdrawn from the system in the form of dividends, which is contrary to the intention of the EU directive.</p> <p>When dividends go to treatment plants that are capital-linked to PROs, this can lead to price dumping and, consequently, to reduced competitiveness in the WEEE market.</p> |
| <b>New risk: oversupply crisis</b>             | <p>With a sharp decline in sales of new equipment and a simultaneous reduction in mandatory collection levels, there is an oversupply of waste equipment. Domestic treatment plants currently have a capacity exceeding one million tons per year, while collection obligations fall below 500,000 tons.</p> <p>In such a situation, the temptation to enter the gray market increases significantly. In practice, this leads to the generation of fictitious recycling certificates and the circumvention of system control mechanisms.</p>                                                                                                                                                                                                                                                                                                                                       |

Table 2. The evolution of the gray economy in Poland

In her work, Anni Heikinheimo (2024) draws attention to the significant threat to the effectiveness of EPR systems resulting from the lack of financial independence of PROs:

*When PROs are linked to treatment plants, there is an increased risk of cost manipulation, reporting of fictitious data, and reduced service quality.*

These phenomena are also observed in Poland and require systemic correction.

It should be emphasized that problems with cost transparency and the ownership structure of PROs are not limited to Poland. In many EU countries, producers do not have access to information about who actually manages them and how the funds from fees are allocated. As indicated in the comparative study, (Andersen 2022) „the lack of transparency in the ownership and management of PROs is a serious problem in many countries.” This lack of transparency reduces the confidence of producers and undermines the effectiveness of the system.

## Systemic problems of capital and control

The minimum capital threshold required to establish a PRO in Poland has not been indexed for 20 years, even though the value of the entire market has increased fifty-fold during that time (ElektroEko's own calculations, 2025).

*The mandatory capital of PLN 5 million, specified in the regulations for WEEE PROs, is now completely disproportionate to the scale of the market, whose value in 2025 is estimated at approximately PLN 1.5 billion.*

By comparison, in France, PROs must regularly obtain ministerial certifications or operate on the basis of environmental conventions. They are also required to submit multi-year financial plans and operational guarantees (Légifrance 2021).

Among the recommendations contained in the *Circularity Gap Report: Poland*, the need to **strengthen reporting, monitoring, and environmental data use systems as a condition for the effectiveness of the circular economy was emphasized**. As indicated: "Without access to reliable, consistent, and up-to-date data, both at the national and sectoral levels, the transition to a circular economy will be fragmented and susceptible to *greenwashing* (Circle Economy et al. 2022, 17)."

*"As payers of the system with full financial responsibility for achieving the required collection and recycling levels, producers should have a say in decision-making processes concerning the selection of operators, cost optimization, and performance monitoring. This follows directly from the »polluter pays« principle and the minimum requirements for EPR systems."*

**Piotr Mazurek**, expert of Konfederacja Lewiatan

## The threat of nationalization of the system

An increasingly serious threat to electrical and electronic equipment PROs is the growing risk of nationalization of the system, as evidenced today by the publicly declared plans of the Ministry of Climate and Environment to liquidate PROs in the area of packaging (Rekopol.pl 2025b; Odpady i środowisko 2025, 64). Transferring this model to the WEEE sector would not only mean a complete loss of control that producers have over their responsibilities and its transfer to a single state operator, but also a profound destabilization of the entire system of collection and treatment of waste equipment.

*Such a scenario creates a real risk of subordinating market mechanisms to the interests of selected treatment operators who have overinvested in the past and are now seeking to recoup their costs at the expense of the efficiency and transparency of the system (Rekopol.pl 2025a).*

As emphasized by Nerdjes et al. (2024), "central planning and lack of social control result in system inefficiency, low collection rates, and inefficient use of resources." The authors also point out that "when

financial management is carried out at the state level, funds allocated for selective collection often disappear into the broader operating budget of the administration, with no guarantee that they will be returned to environmental purposes”.

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“In accordance with the principle of extended producer responsibility, producers should have a real influence on the supervision of the WEEE EPR scheme. Producers bear the costs of the system, so they should have an influence on its effectiveness and fairness by participating in the supervisory boards of PROs, co-creating industry standards, and having access to audits.”

**Tomasz Książek**, Signify Poland and Baltic States

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## Conclusions

The Polish WEEE EPR scheme requires thorough modernization in the areas of ensuring transparency of waste and financial flows, eliminating the risk of generating artificial collection masses, effective supervision of all links in the system, and improving the operation of the Waste database system (Odpady i środowisko 2014; Odpady i środowisko 2015; Odpady i środowisko 2016).

*However, it should be remembered that the European experience serves as a warning against the temptation to nationalize and subordinate the process of waste collection, treatment, and recycling to the state, and especially to take over sources of financing.*

An analysis prepared by the University of Padua indicates that **clearing house models that preserve market competition and operational independence are more effective than centralized monopoly systems**. At the same time, researchers warn that although “a model based on a high level of competition may lead to duplication of infrastructure and increased coordination costs, **complete centralization may in turn lead to a loss of flexibility and a decline in environmental efficiency**” (Dieste et al. 2017, 9).

In view of these findings, it is clear that Poland needs data validation mechanisms and public cost control to rebuild stakeholder confidence.

## The ineffectiveness of the Waste Database as a barrier to an effective waste management system in Poland

### THE WASTE DATABASE WAS SUPPOSED TO BE THE FOUNDATION OF DIGITAL WASTE MANAGEMENT

The Waste Database was created as a key tool for the digitization of the Polish waste management system. From the outset, it was planned that the Waste Database would enable the ongoing monitoring of waste flows, control of reporting obligations, and calculation of indicators for the level of selective collection, recycling, and preparation for reuse. The Waste Database was to be the backbone of the system enabling Poland to meet its ambitious commitments under the EU Waste Directive (MKiŚ 2025).

*Since 2018, nearly PLN 77 million has been allocated to the construction and maintenance of **Waste Database**. However, despite these investments, the system does not fulfill its basic function (Supreme Audit Office 2025).*

Insufficient IT resources and delays in launching subsequent modules have led to a situation where the Waste Database remains incomplete, non-functional, and inconsistent with other data registers.

“Strengthening oversight is necessary, but it must be done in an intelligent, digital, data-driven way. The priority should be to create a modern Waste Database system that not only records but also analyzes WEEE and financial flows in almost real time. Such a system will allow for the detection of anomalies, cross-referencing of POM/WEEE data, and the reduction of illegal parallel flows. We caution against excessive centralization and politicization of the system.

**Michał Kanownik**, Chairman of Cyfrowa Polska Association

## LACK OF KEY FUNCTIONS FOR MONITORING AND CONTROL

In its 2025 report, the Supreme Audit Office clearly stated that Waste Database does not allow for the calculation of indicators for the entire country, including the share of individual waste management methods in waste management. The data contained in the Waste Database differ from that submitted to the Central Statistical Office, which makes the system unsuitable as a source of reliable information (Supreme Audit Office 2025).

*Waste Database lacks comprehensive mechanisms for checking the data entered (evaluation) and cross-checking by comparing the mass of the equipment collected with the mass of the waste generated as a result of treatment of the equipment, or by comparing the total mass from the POM reports with the report from the PRO. Currently, such control is only possible at the provincial level.*

It is worth noting that although the Ministry of Climate and Environment formally runs the Waste Database, it lacks both the executive power and the enforcement tools that would enable ongoing control of the accuracy of the reported data. The Waste Database system does not include, among other things, full real-time tracking of masses, nor does it have a function that would enable the calculation of indicators for the entire country showing the share of individual waste management methods in the total waste management in Poland (Supreme Audit Office 2025).

As a result of this situation, reports on the implementation of the National Waste Management Plan had to be based on outdated data from the Central Statistical Office (GUS) and the Central Waste System, rather than on current information from the Waste Database. This delay and lack of data reliability prevent effective waste management at the national and local levels.

The problem of limited control over masses and costs, as well as the phenomenon of fictitious reporting of collections, are symptomatic of poorly designed EPR systems. In a study on the design and implementation of extended producer responsibility under the EU Green Deal (Mallick et al. 2024), the authors emphasize the need to standardize metrics and data auditability, warning against so-called *greenwashing accountability* – a situation in which the system generates the appearance of compliance but does not deliver real environmental results.

*The lack of reliable data in the EPR system not only makes it impossible to manage and control the system, but also creates room for abuse and malpractice. It also prevents responsible business decisions, such as long-term planning or investment.*

The lack of transparency encourages the development of the so-called gray market, where waste is traded outside official channels, collection levels are inflated, or fictitious recycling confirmations are created. In their analysis *Implementation of blockchain technology in waste management systems* (Bułkowska et al. 2023, 7), the authors emphasize that “the lack of reliable data in waste systems leads to the phenomenon of so-called digital inconsistency, in which reported masses and actual flows do not match.” This problem makes it difficult to control collection levels and creates room for abuse in settlements between stakeholders.

This situation threatens not only the achievement of environmental goals, but also fair competition in the market for PROs and treatment plants.

## **INEFFECTIVE WASTE DATABASE EXACERBATES PROBLEMS WITH EPR IMPLEMENTATION**

*The ineffectiveness of Waste Database also has far-reaching indirect consequences. One of them is blocking the effective implementation of extended producer responsibility in Poland.*

The lack of reliable data makes it impossible to control whether producers are actually fulfilling their environmental obligations and also hinders the legislative processes related to the transposition of EU regulations. The Supreme Audit Office has pointed this out repeatedly in its report (Supreme Audit Office 2022)

This is one of the reasons why the European Commission initiated proceedings in 2024 concerning Poland’s breach of its EU obligations. Failure to implement the EPR in accordance with EU law puts Poland at risk of sanctions and undermines the credibility of its declarations regarding the transition to a circular economy.

## **UNTAPPED POTENTIAL OF DATA TO IMPROVE EFFICIENCY AND TRANSPARENCY**

The current functional limitations of the Waste Database prevent the achievement of many objectives beyond the mere recording of waste flows.

*A fully developed database could be a key tool in supporting both local and national waste prevention strategies, the development of repair and reuse centers, infrastructure planning, and effective system cost management.*

The lack of reliable data and integrated system control means that a significant proportion of waste may remain outside the official cycle, which encourages the development of the gray market and unfair practices. The fully functional Waste Database could also serve as one of the basic clearing house tools, which would enhance the transparency and reliability of the entire WEEE management system.

## **CONCLUSIONS AND RECOMMENDATIONS REGARDING THE WASTE DATABASE**

The problems with the Waste Database are not merely technical – they are of fundamental importance to the quality and reliability of the entire waste management system in Poland. The lack of reliable data makes it impossible to:



- monitor the implementation of EU environmental targets,
- effectively implement the EPR system,
- combat illegal waste flows,
- optimize costs and efficiency of collection,
- provide access to aggregated data for system participants (Supreme Audit Office 2022, 22).

The Supreme Audit Office has recommended the urgent introduction of missing functionalities into the Waste Database, including tools for calculating key indicators and ongoing monitoring of the system (Supreme Audit Office 2025). This is a prerequisite for Poland to effectively fulfill its obligations to the EU and society.

## The need for comprehensive public education

Environmental education is one of the pillars of an effective WEEE EPR scheme. Under Polish law, both producers of electrical and electronic equipment and PROs are required to conduct or finance public educational campaigns. The main objectives of these activities are to raise public awareness of selective collection. They should be in line with the guidelines of provincial authorities. As experts point out, not all educational activities are verified in terms of quality, and some organizations implement them only “on paper” through affiliated entities.

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“Polish customers have become very aware of environmental issues and, when deciding to purchase equipment, they pay attention not only to quality and price, but also attach great importance to aspects related to subsequent disposal or recycling. This positive impact associated with the collection of waste equipment is becoming increasingly important in building trust in the brand.”

**Piotr Stelmachów**, VP, Head of Consumer Electronics at Samsung Electronics Polska

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## EDUCATIONAL OBLIGATIONS OF PRODUCERS

Each producer of electrical and electronic equipment on the Polish market has a statutory obligation to finance **public educational campaigns** on the proper handling of WEEE. Pursuant to Article 15 of the WEEE Act, they should allocate **at least 0.1% of their net revenue from the marketing of electrical and electronic equipment** in the previous calendar year for this purpose.

These funds may be transferred to the account of the relevant marshal’s office or spent directly by the producer on information and education activities.

*In order for the expenses to be recognized as fulfillment of the educational obligation, they must be properly documented and accounted for in the annual report. Producers whose calculated amount does not exceed PLN 100 per year are exempt from this obligation, provided that they meet the relevant conditions resulting from the de minimis aid granted by the provincial marshal.*

Supervision over the execution of educational campaigns by producers is exercised by marshal’s offices, which may also impose administrative penalties for failure to comply with this obligation (Journal of Laws 2015, item 1688).

## EDUCATIONAL OBLIGATIONS OF PROS

WEEE PROs are legally required to allocate at least 5% of their net revenues generated from taking over from producers their obligation to collect and treat waste equipment and to spend them on conducting public educational campaigns. These campaigns must be accounted for by January 31 of the year following the end of the reporting period, and any unused funds are transferred to the account of the relevant marshal's office.

*The educational obligation is absolute and not discretionary – PROs are required to demonstrate specific educational activities, supported by documentation (Minister of Climate and Environment 2024).*

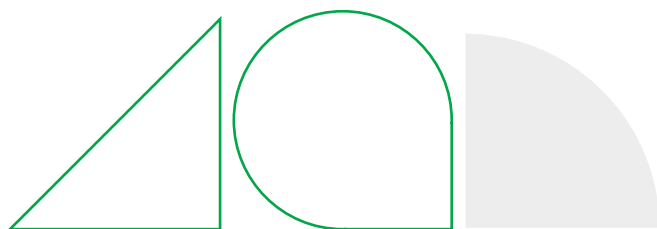
The campaigns must be carried out by the PRO itself, and their course and effects must be described in detail in the annual report submitted to the Waste Database. The purpose of this requirement is to ensure that educational activities have a real reach and informational impact, and are not limited to fulfilling formalities.

## THE ROLE OF PUBLIC EDUCATION IN THE WEEE EPR SCHEME AND THE CIRCULAR ECONOMY

According to a study by GfK Polonia (2023), approximately 75% of the population claims to know how to dispose of waste electrical and electronic equipment, and approximately 65% of respondents indicate that they know the location of the nearest WEEE collection point. Despite a clear increase in awareness of collection points, there is still a strong reluctance to hand in unused devices stored at home (GfK Polonia 2023).

In a scientific paper by Rogowska et al. (2024), it was pointed out that “as many as 41% of respondents declare that they do not sort electronic waste because they do not know how and where to do it.” This results in a significant information and infrastructure gap: although respondents are aware of the importance of proper e-waste management, the lack of specific, practical guidelines limits their actions (Rogowska et al. 2024). As a result, the effectiveness of the WEEE EPR scheme in Poland does not depend solely on the appropriate legal framework and available infrastructure, but above all on actively shaping public awareness.

*This confirms the need for intensive and continuous educational campaigns that should reach a wide audience, providing clear and practical information on the proper handling of waste equipment, in accordance with the provisions of Article 62 of the WEEE Act (2015, 35).*



According to Pascal Leroy, Director General of the WEEE Forum, “the aim of educational activities should be to raise environmental awareness, provide information on the correct ways to dispose of WEEE, and promote the principles of the circular economy (CE)” (TCO Certified 2021). “Only through such measures is it possible not only to increase selective collection rates, but also to reduce illegal practices and abuses, such as the gray market.”

*At the same time, it is extremely important that campaigns are truly public in nature and are conducted by independent, specialized entities. This approach avoids conflicts of interest and increases the credibility of the message (Eko360.pl 2024).*

Environmental education is not only a legal requirement, but also a prerequisite for effective transformation towards a circular economy and the elimination of the gray market, which continues to pose a significant threat to the integrity of the recovery system in Poland. However, it must be carried out in accordance with the law and in compliance with safety rules – electronic waste belongs to the category of hazardous waste. This rule has remained unchanged since the very beginning of the WEEE management system in Poland (Rzeczpospolita 2012).

“Children who learn the principles of waste sorting and responsible management of electronic equipment today will naturally incorporate these practices into their daily habits as adults. What’s more, children and young people become ambassadors of change in their own homes, passing on their knowledge and good practices to their parents and grandparents.”

**Maria Andrzejewska**, Director of UNEP GRID-Warszawa



## Summary

*An analysis of the Polish WEEE management system against European standards and irregularities identified by the Supreme Audit Office (Supreme Audit Office) and the European Commission (Komisja Europejska 2024) clearly indicate the need for a thorough modernization of the current model.*

The key challenges for the Polish WEEE management system are primarily improving transparency in terms of financial flows and ownership structure, which is necessary to increase confidence in the system; reducing conflicts of interest between market participants; strengthening supervision of WEEE flows and the costs of their collection and treatment; and the effective implementation of the principle of extended producer responsibility.

An important element of the necessary changes is also the creation of coherent and comprehensive organizational and technological solutions that will enable more effective control, constant operational supervision, and effective strategic planning for all entities operating in the waste sector, especially in the area of WEEE.

*According to the Supreme Audit Office report (2025) the lack of modern, universal analytical tools and insufficient use of operational data remain significant barriers, limiting the effective management of waste streams.*

The modernization should therefore include both the adaptation of the legal framework and the implementation of digital tools for monitoring processes, detecting irregularities, and accurately forecasting waste volumes, which will translate into rational investment planning and better cost management.

It is also worth remembering that the costs associated with such a reform will ultimately be borne by the economic operators placing equipment on the market, i.e., producers and distributors, and, as a result, consumers, for whom the expenses related to the organization of the collection and processing of waste electrical and electronic equipment will have a direct impact on the prices of products and services. This mechanism was described, among others, by Rzeczpospolita as early as 2013 and remains relevant today (Rzeczpospolita 2013).

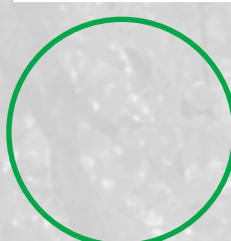
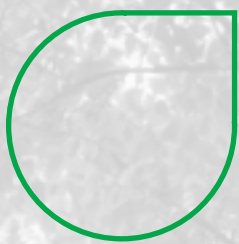
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*"The stability and transparency of the waste management system are essential for the proper implementation of extended producer responsibility principles. Businesses need a predictable, consistent, and long-term legal framework to be able to plan multi-year investments in collection, sorting, and recycling infrastructure."*

**Piotr Mazurek**, expert of Konfederacja Lewiatan

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# 3 CASE STUDIES AND LESSONS FROM EUROPE





## Introduction

The case studies present different approaches to the organization and functioning of WEEE EPR schemes in selected European countries. They show that an effective model must be adapted to national legal and economic realities, although it is possible to identify common elements that promote efficiency and transparency: a strong role of producers, financial transparency, central coordination (e.g. a *clearing house* mechanism), and the mandatory involvement of all market participants (*all actors*).

*For years, Europe has served as a “laboratory” for the development of extended producer responsibility (EPR) models in the field of e-waste  
(European Commission 2025a; European Parliament and Council (EU) 2018).*

The diversity of solutions allows us to identify practices that increase collection and recycling rates, support the circular economy, and protect the interests of consumers and producers. At the same time, some examples show that excessive centralization and detachment of the system from market realities can lead to destabilization and loss of trust.

This section of the report discusses nine countries that illustrate different models and may serve as a reference point for the future of the Polish system:

- **Austria** – four PROs that can be set up by treatment plants, and the EAK clearing house, which ensures equal treatment of market participants (EAK-Austria 2023).
- **Belgium** – one PRO (for WEEE excluding PV) operating as a *not-for-profit* (Recupel 2024).
- **France** – model with OCAD3E clearing house (2014) (Légifrance 2021).
- **Spain** – gradual modernization and overcoming barriers to the implementation of the EPR, with emphasis on e-commerce technologies and regulations (Jefatura del Estado 2022).
- **The Netherlands** – the only country in the EU that does not show a gap between the mass of Waste Generated and documented and accounted for e-waste flows (Ilgemann et al. 2025).
- **Germany** – central registry and clearing house operated by the independent EAR foundation (2004)
- **Norway** – the highest level of WEEE collection per capita – 19.5 kg/capita in 2022 (Eurostat 2024a).
- **Italy** – consortium system, CdC RAEE clearing house, and trust funds securing the recycling of products with a long functional cycle (Gazzetta Ufficiale 2014).
- **Hungary** – an example of centralization and nationalization of the system, demonstrating a decline in efficiency and loss of trust (EEA 2025).

The cited case studies highlight both good practices and potential risks that Poland should avoid when designing a long-term model for waste recovery.

# The landscape of PROs in Europe

## WHAT IS THE REASON FOR THE DIVERSITY OF PRO MODELS IN EUROPE?

The diversity of PRO models in Europe is largely due to the fact that the WEEE Directive, despite setting targets and general principles, did not specify many key organizational and operational aspects. This left Member States with considerable freedom to shape their national systems, which led to significant differences in their structure, scale, and effectiveness. The shape of individual solutions is the result of different legal traditions, economic structures, and political preferences.

*In some countries, such as France and the Scandinavian countries, a deeply rooted culture of environmental responsibility and state supervision favors the creation of collective schemes, with central coordination and mandatory participation of all operators in the system.*

## METHODOLOGICAL NOTE

This analysis is based on data from a survey conducted among WEEE Forum members in July 2025 and an analysis of available source materials (*desktop research*). The report covers systems operating in Belgium, France, Spain, the Netherlands, Germany, Norway, Hungary, and Italy, based on their specific characteristics, the solutions they use, and the challenges they currently face. It should be noted that in the case of the German and Hungarian systems, the analysis is based solely on secondary data, without taking into account direct responses from the survey.

## AUSTRIA

There are four PROs operating in Austria, including UFH Elektroaltgeräte Systembetreiber GmbH and UFH Altlampen Systembetreiber GmbH (founded in 2005). The organizations were established by producer and importer organizations and operate as commercial companies.

*Each Austrian PRO handles all product groups and must offer at least one collection point per district in Austria (2025 survey).*

**Management structure and supervision:** The supervisory body is the *board of foundation*. PROs must have a permit from the Ministry of the Environment and a commercial permit. The Ministry of the Environment verifies the data and renews the permits for PROs. Austrian law allows for the creation of PROs by treatment facilities (2025 survey).

**Cooperation with the state:** PROs are partners for the government and local authorities in implementing waste management policy, but there are no direct financial or managerial links between PROs and the administration (survey 2025).

**Clearing house:** the Austrian system has a *clearing house*, EAK (Elektroaltgeräte Koordinierungsstelle Austria GmbH), established on May 11, 2005, as a limited liability company. EAK is a *not-for-profit* organization, and its shareholders include the Austrian Chamber of Commerce and representatives of producers. The company acts as a central coordination platform, ensuring equal treatment of all obligated parties. EAK's activities include, among others:

- coordination of the collection of waste equipment from municipal collection points, in accordance with specific quantity thresholds for individual categories of equipment and batteries; if a point does not have a direct contract with the collection system, EAK organizes collection in cooperation with approved systems (so-called collection coordination),
- auditing and control of system participants, implemented from 2023 – this includes independent compliance tests and verification of 80% of the equipment and batteries reported to the system in a three-year cycle,
- maintaining central registers and reporting, including integration with the national EDM system and the eKS application for reporting collection requests,
- educational and informational activities, including providing materials for system participants, organizing training, conferences, and public campaigns (e.g. through platforms such as elektro-ade.at or rundgehts.at) that increase consumer awareness and support improvements in the quality of selective collection.

Thanks to these functions, EAK acts as the institutional “backbone” of the Austrian WEEE EPR scheme, ensuring its transparency, efficiency, and compliance with the law.

The organization operates on the basis of a permit issued by the Austrian Ministry of the Environment in 2005 for a period of 10 years, subsequently extended in 2015 and adapted to legislative changes in 2018 (EAK-Austria 2023).

**Collection levels:** Austria uses a system based on equipment placed on the market (POM), and according to *Global E-waste Monitor 2024*, the country generated approximately 22 kg of WEEE per capita in 2022, which means a documented collection rate of approximately **68% of waste generated – above the EU average**. The collection rate is approximately 50% POM (2025 survey). Eurostat data (2022) indicate an achievement of 15.14 kg/capita.

#### Challenges:

- legal obligation for trading platforms to ensure the participation of their retailers in the PRO,
- lack of independent audit of the PROs,
- lack of audits in treatment plants by PROs.

## BELGIUM

*The Belgian system is based on the activities of a single PRO – Recupel, established in 2001 by manufacturers and importers of electrical and electronic equipment in response to the introduction of the EU WEEE Directive (according to a survey, its legal status was renewed in 2020).*

The organization has a *not-for-profit* status (ASBL/VZW) and effectively controls 100% of the WEEE market, with the exception of photovoltaic panels handled by PV Cycle. It operates on the basis of permits granted by three regional governments: Flanders, Wallonia, and the Brussels-Capital Region (Recupel 2024).

**Management structure and supervision:** supervisory bodies include a general assembly and a board of directors consisting of producers and representatives of industry federations. Representatives of regional authorities sit as observers on the board of directors without voting rights. The organization is required to hold quarterly meetings with regional authorities (2025 survey).

**Cooperation with the state:** Recupel is a partner for the government and regional authorities in implementing waste management policy. The central authorities are represented on the board of directors and at the general

meeting. As a *not-for-profit* organization, Recupel does not generate profits for its members—all funds from fees must be reinvested in the system (2025 survey).

**Fulfillment of obligations:** Belgium uses a system of targets based on POM. There is no clearing house established in the country, as this is not necessary with a single PRO. The system achieves high rates – 58.06% of POM without PV panels (2023 survey).

**Collection levels:** In 2024, Recupel collected 134,446 tons of WEEE, representing a 5.2% increase year-on-year (survey). Belgium achieved a collection rate of 14.1 kg/capita (Eurostat 2022b).

### Challenges:

- *free riding*, a phenomenon whereby some companies (e.g. manufacturers or importers of electrical and electronic equipment, especially those selling online) avoid their legal obligations to register, pay fees, and report. Free riders do not bear the costs of the collection and recycling system, even though they place products on the market, which gives them an unfair competitive advantage. This results in a decrease in collection efficiency, lower revenues for the system, and higher costs for legal participants. New regulations coming into force in 2025 are intended to reduce the problem of free riding,
- unreported exports of WEEE,
- WEEE in scrap metal and general waste,
- and a limited number of recyclers for certain groups of WEEE.

## FRANCE

The French WEEE management system is based on three PROs (*éco-organismes*) operating under licenses granted by the Minister of the Environment (Légifrance 2021). Currently, operating in France are: Ecologic and ecosystem, which handle all categories of WEEE except photovoltaic panels, and Soren, which specializes in photovoltaic panels (2025 survey).

*The French system is characterized by a competitive model with a central clearing house, OCAD3E (Organisme Coordonnateur Agréé pour les Déchets d'Équipements Électriques et Électroniques), established in 2006.*

**Legal structure and supervision:** PROs in France operate as joint stock companies (*société anonyme*, SA) with non-profit status – all profits must be reinvested in the system. The system is supervised by the Ministry of the Environment and the environmental agency ADEME (*Agence de l'environnement et de la maîtrise de l'énergie*), which verify the data provided by PROs (2025 survey; ADEME 2025).

**The supervisory bodies of each PRO are:** the general meeting of shareholders, the supervisory board, and the board of members. In addition, there is the CPP (*Comité des parties prenantes*) – a stakeholder committee consisting of representatives of five groups: recyclers, producers, non-governmental organizations, distributors, and local government representatives, with five people from each group. This structure aims to ensure a balance of interests between the various parties involved in the system (Légifrance 2021).

**Clearing house:** OCAD3E acts as the French clearing house for WEEE, employing one person and responsible for financial balancing between PROs. OCAD3E coordinates financial flows within the system and ensures a fair distribution of responsibilities among PROs. It acts as a “one-stop shop” (*guichet unique*) for local authorities and coordinates joint information campaigns, uniform reporting, and the creation of framework agreements with local authorities. Within the OCAD3E structure, each shareholder has one vote.

**Database and transparency:** France has a central database managed by the environmental agency ADAME, which is used for monitoring and planning. The data is publicly available for analysis, although not all details provided by PROs are disclosed to the public (2025 survey).

**Market shares:** In terms of tonnage, Ecologic has a 30% market share, while ecosystem has 70%. However, Ecologic serves a larger number of members – 26,000, including online retailers in particular. The organizations specialize partly in different product categories: Ecologic has a larger share in IT equipment, while ecosystem dominates in large household appliances, which is due to the historical division of the POM market (2025 survey).

**Collection levels:** France achieved a collection rate of 14.65 kg/capita (Eurostat 2022b), and according to a survey, in subsequent years (including photovoltaic panels) the following collection parameters were achieved:

- in 2023: 44% POM, 56% Waste Generated
- in 2024: 52% POM, 63% WG.

The significant difference between the POM and WG indicators is due to the large quantities of equipment placed on the market in 2020–2021 (survey, 2025).

#### Challenges:

- achieving collection targets (problems with scrap metal and exports),
- establishment of an effective system of differentiated fees and development of repair and reuse,
- no additional subsidies for servicing hard-to-reach areas, such as rural areas,
- *free riding* and management of e-waste from online and unregistered sales, where producers may underreport actual quantities of POM.

## SPAIN

The system in Spain is highly fragmented, with 12 PROs and 58 individual compliance schemes of producers operating there. FUNDACIÓN ECOLEC (founded in 2004 by associations of large and small household appliance producers) controls 25% of the market. ECOTIC remains the largest organization with over 850 members. Most PROs operate as *not-for-profit* entities (foundations or associations), although there are exceptions, such as the commercial ERP España (2025 survey).

*The government-independent clearing house OfiRaee coordinates the activities of nine PROs (88% market share), automating the management of WEEE collection (OfiRaee 2005).*

**Management structure:** in the case of FUNDACIÓN ECOLEC, the supervisory bodies include a board of members, a supervisory board, and provide for the participation of producers in working groups set up for specific product categories. The foundation is supervised by the foundation's protectorate (administrative body). Members of the management board of a PRO and its employees may not be associated with treatment facilities, and PROs may not own shares in them (2025 survey).

**Cooperation with the state:** PROs are not formal partners of the government in the implementation of waste policy. Data is verified by regional government environmental authorities in coordination with national authorities. A financial guarantee of 25% of annual operating costs is mandatory (Jefatura del Estado 2022).

**Fulfillment of obligations and clearing houses:** Spain is transitioning from a system of targets based on POM to targets based on Waste Generated (85% from 2025). From 2025, it is planned to establish a global clearing house managed and financed by PROs (2025 survey).

**Collection levels:** According to *Global E-waste Monitor 2024*, annual WEEE generation in Spain is approximately **20.1 kg/capita**. (Baldé et al. 2024). This figure is significantly higher than the official collection rate of 8.71 kg/capita (Eurostat 2022b).

**Challenges:**

- declaring fictitious collection amounts,
- sporadic domination of a single interest group,
- most trading platforms do not comply with the law despite their legal obligations,
- lack of enforcement,
- *free riding* of online trading platforms.

## GERMANY

In Germany, responsibility for the collection, recovery, and recycling of WEEE lies with the producers, who must provide financial guarantees each year to cover future waste management costs. They can fulfill their obligations independently or through commercial operators (*Beauftragte Dritte, Compliance Dienstleister*) – companies (most often GmbH) operating on the principles of market competition and focused on profit (Umweltbundesamt 2025).

*The Stiftung EAR (Elektro-Altgeräte Register) foundation, established by the producers in 2005, plays a central role in the German system. It has the status of a public body and acts on behalf of the Federal Environment Agency (UBA) as clearing house in the model not-for-profit.*

**Management structure:** Stiftung EAR has an extensive organizational structure comprising: an assembly (which sets the general direction of activities), an administrative board (3–7 members), an audit committee (5 members and 2 deputies – three members are appointed by ministries), an arbitration committee, and a director general with a 9-person operational team (Stiftung EAR 2004).

**Obligation allocation system:** the foundation manages the registration of producers and assigns them WEEE collection responsibilities using the so-called *Abholanordnung* mechanism, i.e., an automatic decision on waste collection. The system assigns the collection obligation to the producer who has so far fulfilled the smallest part of their obligation, which ensures a fair distribution of costs in accordance with each company's market share (Bundesumweltministeriums 2022).

**Collection levels:** Germany is one of the leaders in terms of equipment placed on the market – 1.8 million tons and WEEE generation – 1.8 million tons per year in 2022 (Baldé et al. 2024). According to Eurostat data (2022b) Germany achieved a collection rate of 10.8 kg/capita.

## THE NETHERLANDS

In the Netherlands, a uniform WEEE EPR scheme has been in place since 2021, based on the Stichting OPEN (Organisatie Producentenverantwoordelijkheid E-waste Nederland) foundation, which was established by manufacturers and importers as a *not-for-profit* organization. This organization, which controls 100% of the market, has taken over the tasks of all previous PROs.

*Mandatory participation in the system is ensured by the so-called Universal Applicability Declaration, which imposes an obligation on producers to participate and contribute to its financing (Ministry of Infrastructure and Water Management 2025; Waterstaat 2020).*

**Management structure:** the foundation has a supervisory board and operates on the principle of full transparency. It cooperates with the state-run Nationaal (W)EEE Register, which plays a supervisory but not an operational role. The foundation does not generate profit – any financial surpluses are reinvested in the system or translate into lower contributions for producers (Stichting Open 2025).

**Cooperation with the state:** Stichting OPEN is a partner of the government, but retains its own responsibilities and operational autonomy. It holds regular coordination meetings with the administration, without any direct financial or managerial links. The national government verifies data during registration and supervises the implementation of objectives. The system does not require a clearing house thanks to centralization within a single organization (2025 survey).

**Operating model:** The foundation uses a fully outsourced model – it does not perform physical operations, but contracts specialized partners for collection, treatment, and recycling on the basis of tenders. This solution ensures the professionalism of services while maintaining competition between contractors. Educational activities are carried out voluntarily (albeit intensively) under the Wecycle brand. They include media campaigns, local activities, and the development of a network of over 30,000 collection points (2025 survey).

**Fulfillment of obligations:** the Dutch system has switched to a “Joint Responsibility” model (UPV 2.0), radically departing from the traditional target of collecting 65% of POM in favor of 85% in relation to waste actually generated (*Waste Generated*) (2025 survey).

**Collection levels:** In 2024, 238,500 tons of WEEE and batteries were collected, while 652,000 tons of new equipment entered the market. The collection rate was 14.2 kg/capita, with POM = 36.4 kg/capita and *Waste Generated* = 20.9 kg/capita (data of Stichting OPEN 2024). According to Eurostat data for 2022, the Netherlands achieved a collection rate of 11.27 kg/capita.

**Monitoring of parallel flows:** The Netherlands is the only country in the EU that shows no gap between the weight of WEEE generated, and the documented and accounted flows of e-waste, making it a leader in monitoring WEEE flows (Ilgemann et al. 2025). This success is due to Stichting OPEN’s voluntary investments in reporting informal flows that go beyond the requirements of the WEEE Directive; conducting annual studies on the morphology of municipal waste from households; cooperation with the metal recycling sector as part of a takeback program that rewards scrap dealers and metal recyclers for transferring WEEE to treatment facilities. According to Ilgemann (2025) this has enabled the proper recovery of an additional 42,000 tons of waste equipment per year, which in the case of the Netherlands amounts to approximately 2.4 kg/capita, representing 20% of the annual WEEE collection in that country.



**Takeback (the Netherlands)** – a mechanism introduced in 2021 by Stichting OPEN, which is part of the national extended producer responsibility system for waste electrical and electronic equipment. It consists in metal recovery companies receiving remuneration for transferring WEEE to authorized treatment plants instead of directing it to informal channels. This solution significantly reduces the outflow of e-waste outside the official system, increases selective collection levels, and improves the quality of reporting data. The takeback model also strengthens cooperation between the metal recycling sector and the producer organization, which promotes cost stability and transparency in the functioning of the system (Ilgemann et al. 2025).

Despite effective monitoring, the Netherlands still lacks data on informal market entry (*free-riding*), estimated at 5–10% of the official POM, and on the exact volumes of exports of waste equipment for reuse (estimates range from 5–30 kt/year) (Ilgemann et al. 2025).

#### Current challenges:

- combating *lekstromen* – uncontrolled waste flows that bypass the official system. The Foundation advocates the introduction of mandatory handover of waste equipment exclusively to certified treatment facilities,
- tracking and eliminating free riding, especially in online commerce (this remains an ongoing problem requiring constant vigilance),
- from 2026, it is planned to introduce partial upfront fees for long-life products (such as PV panels and heat pumps), which represents a transition from a *pay as you go* system to a model that takes into account future recycling costs.

## NORWAY

*There are four PROs operating in Norway, including Norsirk (founded in 1998 by producers). The organizations are commercial companies (AS). The system is supervised by the Ministry of Climate and Environment through the Norwegian Environment Agency (Miljødirektoratet/MDIR) and the county authorities (fylke).*

**Management structure and supervision:** PROs must obtain approval from the MDIR to commence operations in accordance with *Avfallsforskriften kap. 1* (waste regulations) (Klima- og miljødepartementet 2025). Financial reserves for six months of operation are required, and ISO 14001 certification is mandatory, while ISO 9001 certification is recommended. Organizations are subject to annual volume audits by an auditing company and ISO compliance audits conducted by accredited entities.

**Cooperation with the state:** PROs participate in the creation and amendment of waste regulations, providing knowledge based on operational experience. Apart from public consultations, information meetings, and occasional presentations, there are no formal structures for dialog with public administration.

**Fulfillment of obligations:** The Norwegian system is based on the POM methodology. A distinctive feature is the compensation of transport costs for all locations in Norway, differentiated according to distance from treatment plants, most of which are located within a 150 km radius of Oslo. Organizations are required to conduct audits at treatment plants, either independently or through third parties. The country does not have a clearing house, although the issue has been considered. Organizations are required to implement educational campaigns, as are stores selling electronic equipment.

**Collection levels:** Norway has the highest WEEE collection rates in the world. According to Eurostat, the levels for 2022 are as follows: 19.5 kg/capita (almost twice as much as the EU-27 average: 11.2 kg/capita). The four main organizations collect a total of approximately 72% of the WEEE generated (107,000 out of 149,000 tons in 2022). Of the WEEE collected, 81% is subject to material recovery, 10% to energy recovery, 7% goes to landfills, and 2% is reused (2025 survey).

**Challenges:**

- permanent conflict of interest in the sector: the key issue is the ownership of waste and its growing economic value – intermunicipal waste companies are setting up their own low-level treatment plants in order to sell waste to the “highest bidder.”
- the problem of treatment plants applying to set up PROs,
- *free riding* by online retailers remains a priority area, as it does throughout Europe.

## ITALY

The Italian WEEE management system is based on a model of collective *consortia* operating under Decreto Legislativo 49/2014 (Gazzetta Ufficiale 2014).

*There are **14 PROs** operating in Italy (all officially not-for-profit), including Erion WEEE (formed in 2020 from the merger of Ecodom and Remedia, active since 2008). The founders are producers of electrical and electronic equipment, with the participation of treatment facilities permitted.*

**Management structure:** the supervisory bodies of the consortia include a supervisory board and a general meeting. The supervisory board includes two government representatives. The bylaws of the PRO must comply with the standard statutes specified by law. All PROs must be ISO 9001 and 14001 certified.

**Clearing house:** Since 2007, the **Italian** system has been coordinated by the **CdC RAEE (Centro di Coordinamento RAEE)** clearing house, which manages the allocation of collection points in proportion to the market shares of PROs in five WEEE groups. Membership in CdC RAEE is mandatory for all PROs. The clearing house conducts technical and environmental audits of treatment facilities on behalf of PROs and uses a methodology similar to WEEE Labex for this purpose (**CdC RAEE 2007**).

**Implementation of obligations and financing:** the Italian system is based on the POM methodology. All WEEE is financed by a *pay-as-you-go* system, with the exception of PV panels covered by a financial guarantee system, i.e., an advance payment into a special trust fund account to cover the costs of collection, recovery, treatment, and recycling for 15–20 years.

**Collection rates:** according to Eurostat data for 2022, the average collection rate was 9.06 kg/capita.

**Challenges:**

- parallel and uncontrolled flows, resulting in half of the WEEE mass disappearing,
- insufficient control by the authorities,
- low financial transparency,
- conflict of interest due to treatment facilities forming PROs,
- new regulation for trading platforms: each platform declares its POM and the POM of sellers, collects fees, and transfers them to PROs.

“The effectiveness of WEEE collection in Italy varies significantly depending on the level of commitment and organization at the local level,” note Ghisellini et al. (2023)

| CATEGORY                                             | CHARACTERISTICS / INFORMATION                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Legal status</b>                                  | Most PROs operate on a <i>not-for-profit</i> basis (e.g. Recupel – Belgium, ECOTREL – Luxembourg, Stichting OPEN – Netherlands). They are mainly established by producers (e.g. Czech Republic, Spain, Slovenia).                                                                                                              |
| <b>Funding</b>                                       | The source of funding are the fees paid by producers; financial guarantees are often required (e.g. Spain – 25% of annual costs, Belgium – 6 months of operation).                                                                                                                                                             |
| <b>Relationship with administration</b>              | The authorities often perform a supervisory or observer role (e.g. Belgium, Spain), and in some countries there are advisory bodies involving local governments and NGOs (e.g. France – CPP).                                                                                                                                  |
| <b>Public education</b>                              | The responsibility for financing education usually lies with PROs (e.g. Czech Republic, Austria, Spain). Local authorities support campaigns but do not implement them themselves.                                                                                                                                             |
| <b>Audit and review</b>                              | Mandatory financial and operational audits (e.g. Austria – ISO, Norway – DNV/PWC). Audits at treatment plants conducted, among others, in Italy (by a <i>clearing house</i> ) and Belgium (external depollution audit).                                                                                                        |
| <b>Creation of organizations by treatment plants</b> | Prohibited or restricted in Belgium, Spain, Luxembourg, the Czech Republic, France, and the Netherlands. Permitted under certain conditions in Austria, Italy, and Slovenia. Work on this issue is ongoing in Norway.                                                                                                          |
| <b>Specialization of organizations</b>               | Most organizations cover all equipment groups (e.g. France, the Netherlands, Austria). Exceptions: PV Cycle in Belgium and the Czech Republic (separate systems for PV panels), B2B/B2C in Norway.                                                                                                                             |
| <b>Market model</b>                                  | One entity organizes the system: Belgium, the Netherlands, Luxembourg. Competitive systems are in place: Spain (12 PROs + 58 individual compliance schemes), Italy (14), the Czech Republic (13), France (3), Norway (4), Slovenia (5), and Austria (4).                                                                       |
| <b>Clearing house</b>                                | Present in: Italy (CdC RAEE), France (OCAD3E), Spain (OfiRae – under formation), Germany (Stiftung EAR), Austria (EAK).                                                                                                                                                                                                        |
| <b>Collection system</b>                             | POM as the basis: Belgium, the Czech Republic, Austria, Italy, Norway. WEEE Generated: France, the Netherlands (since 2024), Spain (since 2025). Slovenia: hybrid approach.                                                                                                                                                    |
| <b>Long-life products</b>                            | No separate rules: Luxembourg, Norway, France. Special mechanisms: Italy (trust fund for PV), Netherlands (advance fees from 2026), Spain (change in collection model due to PV), Slovenia (the actual burden associated with the collection and recycling of long-life products will only increase significantly after 2030). |
| <b>Hard-to-reach areas</b>                           | No support: Belgium, the Czech Republic, Spain, Luxembourg, Slovenia, France. Support mechanisms: Austria (collection point in each municipality), the Netherlands and Norway (transport subsidies), Italy (allocation through a <i>clearing house</i> ).                                                                      |
| <b>Systemic problems</b>                             | Common problems include: free-riding (e.g. the Netherlands, Spain, Slovenia), illegal export of waste equipment (e.g. France), WEEE in municipal waste (e.g. the Czech Republic, Spain).                                                                                                                                       |

Table 3 Comparison of the functioning of WEEE PROs in Europe

## HUNGARY

The waste management system in Hungary has undergone a radical transformation over the last decade, with the declared goal of achieving the EU target of 65% waste recycling by 2035, with a maximum of 10% of waste going to landfill (Hung. 2022).

*This process began in 2011 with the gradual nationalization of municipal waste collection and processing, culminating in the introduction of a concession system in July 2023 (Pavol Bors 2024).*

Between 2003 and 2011, Hungary operated a system based on corporate responsibility and market competition (Przegląd Komunalny 2021). Since 2012, further changes have been introduced, including an environmental tax and the establishment of the National Waste Management Agency (OHÜ – Országos Hulladékgazdálkodási Ügynökség) as the redistributing entity.

In 2015, the government established the state-owned company NHKV Zrt., which was entrusted with the coordination and management of assets in the national waste management system (NHKV 2024).

*In 2017, Hungary introduced new service standards that reduced the number of waste collection companies from around 140 to 25, allowing only entities in which at least 51% of the shares were owned by the state or local governments to operate in this sector (EAA 2022).*

In 2018, the Hungarian Ombudsman pointed to over 400 changes in regulations that led to inconsistencies in the law and reduced the effectiveness of the system (Pavol Bors 2024). The financing structure remained insufficient—residents' fees did not cover the actual costs of waste management, which created budgetary difficulties for municipalities (Pavol Bors 2024). In 2020, a proposal was made to fully nationalize waste management (Przegląd Komunalny 2021).

**MOL concession and centralization of the system:** from July 1, 2023, the concession for waste management was granted to MOHU (MOL Hulladékgazdálkodási Zrt.), a subsidiary of the state-owned MOL concern (MOL GROUP 2023a; 2023b). The 35-year concession covers the collection and preliminary processing of municipal waste. The MOL Group has committed to allocating HUF 185 billion (approximately EUR 450 million) to the development of the system over the first ten years and to paying an annual concession fee of HUF 100 million to the state budget (Hung. 2022).

The new regulations have eliminated PROs from the market in selected waste streams, including packaging, industrial and automotive batteries, and selected groups of electrical and electronic equipment, replacing them with a state-run system based on product fees.

*The Hungarian model has effectively separated producers from the collection and recycling processes.*

The selection of recyclers is the responsibility of the licensed operator, and the tendering procedures can take up to several months, causing delays in settlements with municipalities of up to 18 months (Przegląd Komunalny 2021).

**WEEE results:** according to Eurostat data, between 2014 and 2022, the mass of electrical and electronic equipment placed on the Hungarian market increased from 9.46 kg to 33.1 kg per capita, but WEEE collection rates did not keep pace with this trend. In 2022, they amounted to 9.8 kg/capita, compared to the EU-27 average of

11.2 kg (Eurostat 2022b). The increase in the collection rate during this period – from 5.27 kg/capita to 9.8 kg – was significantly slower than the increase in the mass of equipment placed on the market (Eurostat 2022b).

**Consequences and system evaluation:** systemic changes have become a subject of interest for EU institutions. The European Anti-Fraud Office (OLAF) recommended the repayment of nearly €11 million following an audit of waste management projects financed by EU funds, pointing to, among other things, errors in planning, violations of objectives, and a lower than expected environmental impact (OLAF 2022).

*Experts point out that the current model is an example of **risky solutions**: 80% of fees go to the state budget, and only 20% remain in the system, resulting in chronic underfunding, reduced private investment, and declining recycling rates (Przegląd Komunalny 2021).*

**Challenges:** the case of Hungary illustrates the potential risks of excessive centralization and nationalization of the waste management system. Although the formally adopted model is intended to support the objectives of the circular economy, in practice it faces operational, financial, and organizational barriers that result in a decline in efficiency, transparency, and public trust.



## Summary

An overview of WEEE recovery systems in selected European countries shows that, despite a variety of institutional and legal solutions, effective systems share a common denominator: transparency, stability, independence of PROs, and strong links with local communities through education and activities that engage residents.

*The experiences of Norway, France, Belgium, and the Netherlands prove that properly shaping the relationship between producers, PROs, and the state allows for high levels of collection and recycling to be achieved while maintaining acceptable costs and a high level of public trust.*

These are the most effective systems – all are based on *not-for-profit* PROs and managed by producers.

Free-riding remains a common challenge for many European countries, as indicated by most PROs participating in the survey conducted for this report in July 2025. This problem particularly affects online retailers and e-commerce platforms, especially those outside the EU, who place equipment onto national markets without registering and paying fees to the system. The problem is particularly acute in Spain, where many trading platforms fail to comply with the law despite clear obligations under waste legislation (declaration, financing, reporting), and enforcement against them remains ineffective. Belgium plans to introduce new regulations in 2025 specifically aimed at reducing this phenomenon, while an organization in France describes it as “always a major problem,” and Norway identifies it as an area for priority action. Elektrowin a.s., a Czech member of the WEEE Forum, draws attention to a specific free-riding mechanism, whereby some sellers from outside the European Union do not register and abuse the EU’s duty-free limit of €150. The Slovenian organization emphasizes that registered producers are effectively covering the costs of unregistered entities unfairly. This systemic challenge not only distorts fair competition, but also reduces revenues to the system, increasing costs for legally operating producers.

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„We need an active verification of non-EU importers through online platforms. Thousands of companies selling in Poland are not registered with the BDO at all, and no one even checks this. The law must keep pace with changes. Bad, ineffective, and impractical regulations should be abolished or updated.”

**Wojciech Konecki**, Association of Household Appliance Manufacturers – APPLiA Polska

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The effectiveness of the system varies in countries where, as noted in the Comparative *study of national differences in the implementation of the WEEE Directive in Europe, the perspective of producers* (Andersen 2022) – producers often have no real influence on the management of PROs, and the cost structure is unclear and difficult to verify. The study indicates that “differences in the costs of compliance with the WEEE EPR scheme are as high as tenfold between Member States”, which directly affects the competitiveness and motivation of companies to invest in environmental measures.

*Despite relatively good results in terms of the mass of e-waste collected, Poland continues to struggle with problems that other countries have managed to reduce or eliminate.*

These include, among others, the existence of parallel collection streams, i.e. a situation in which WEEE does not enter official channels subject to control and recording, but is illegally dismantled and stripped of only valuable parts, which may result in hazardous substances entering the environment; a lack of full cost transparency and unfair competition resulting from capital links between PROs and treatment facilities, and, as a consequence, the unjustified removal from the system of funds transferred by producers for its operation and development.

The experiences of countries that have introduced a recovery model independent of treatment operators confirm the conclusions of the report on the design and implementation of extended producer responsibility under the EU Green Deal (Mallick et al. 2024), whose authors emphasize that „recovery systems should be designed based on the principle of public value governance, rather than profit maximization.”

*In practice, this means that institutions such as PROs must act in the public interest and be free from ownership links with treatment facilities.*

A comparative analysis of EU countries prepared by the University of Padua shows that the highest collection rates are achieved by countries that have implemented sustainable systems based on independent PROs and transparent coordination. “National collection systems, such as those in Belgium, Norway, and Sweden, significantly exceed EU collection and recycling targets and are therefore more effective than countries with a highly centralized model (Dieste et al. 2017, 12).” It is therefore essential not to restrict competition and to ensure clear operating rules and common environmental objectives.

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„Proper waste management and sustainable business practices are a way for companies to build credibility, meet legal requirements, and gain a competitive advantage. Consumers are increasingly choosing brands that genuinely care about natural resources. Actions related to real environmental protection translate into a reduction in the negative impact on the planet and support the circular economy.”

**Marek Maksymiuk, BSH Polska**

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These conclusions form the basis for presenting a proposal for a model of producer responsibility organization for Poland in Part IV of the report. This model is based on a not-for-profit formula, full transparency, and strict control over the flow of materials and costs, with no financial dependence on treatment plants, which eliminates the risk of conflicts of interest. A system designed in this way can ensure stable and effective achievement of the objectives of collection, recovery, and recycling of e-waste in the interests of the environment, producers, and consumers.





# 4 MODEL PRODUCER RESPONSIBILITY ORGANISATION



## Introduction – the need for a new model

The Polish system for managing waste electrical and electronic equipment (WEEE) is currently in need of profound reform. Despite a relatively high collection rate compared to the European Union, it has significant structural weaknesses, including the lack of organizational and financial transparency, conflicts of interest, and limited control over the flow of materials and funds. These problems have been repeatedly highlighted by industry representatives and PROs since the system was launched (Odpady i środowisko, 2016)

*European experience shows that stability, efficiency, and public trust in WEEE EPR scheme are achieved by countries that ensure complete independence from treatment facilities (WEEE Forum 2019). Examples of such solutions can be found in Belgium, the Czech Republic, Spain, France, Luxembourg, the Netherlands, Norway, Slovenia, and Italy, among others, which have set standards that can be adapted in Poland (Baldé et al. 2024).*

The purpose of this chapter is to present a model for WEEE PRO, which forms the basis for a stable and sustainable system, in line with the principles of the EU WEEE Directive and good practices developed in Europe.

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“Producers expect, above all, transparency and certainty that obligations are being fulfilled reliably and in accordance with the law. The choice of PRO is determined by its effectiveness in achieving the required collection and recycling rates, its reliability, experience, and financial stability.”

**Zygmunt Łopalewski, Beko Central Europe**

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After analyzing the best solutions and identifying mistakes made in other countries – including the negative effects of excessive centralization and nationalization of the system in Hungary (OECD 2023; OLAF 2022) – The set of twelve key pillars was developed, on which both the model PRO and the entire system should be based.

## The main pillars of the model WEEE PRO for Poland

### PILLAR 1. CLEAR AND CONTROLLABLE OWNERSHIP STRUCTURE

One of the key foundations of the model WEEE PRO is a transparent and clearly defined ownership structure, which is reflected in the provisions of the Act of September 11, 2015, on waste electrical and electronic equipment (Journal of Laws 2015, item 1688, art. 60). According to the intention of the legislator, the right to establish PROs should be reserved exclusively for producers, importers of electrical and electronic equipment, and their associations – i.e. entities that actually finance the system and bear responsibility for its operation. Such a solution promotes consistency of interests, reduces the risk of conflicts, and strengthens the trust of all participants in the system.

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“According to the law, it is the producers who are responsible for setting up PROs, as they are responsible for collecting waste equipment and reusing the materials obtained. Companies should supervise the system, as they are an integral part of it, and should do so through industry organizations.”

**Piotr Stelmachów**, VP, Head of Consumer Electronics at Samsung Electronics Polska

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In practice, this principle is not fully implemented in Poland.

*Although some PROs were established by producers, a significant number of them was established on the initiative of entities whose core business is not related to placing equipment on the market.*

In many cases, the possibility of formally “placing” a small batch of equipment, e.g. several dozen kilograms at a time, was used solely to meet the registration requirements, which made it possible to obtain the status of a PRO. Cases were also identified where PROs were set up by treatment facilities which, as participants in the operational stage, should not have ownership control over the entities responsible for financing and organizing the system.

Such links can lead to unclear financial flows, violate the principles of fair competition, and undermine the transparency of the entire model by:

- the possibility of falsifying the actual processes of waste equipment management, pressure to maximize profit at the expense of environmental quality and prices for producers, which has a direct impact on consumer prices,
- price dumping.

The need for a clear separation of ownership between PROs and treatment facilities, and their control by producers, is confirmed by qualitative data. According to the study of national differences in the implementation of the WEEE Directive in Europe (Andersen 2022), “many producers do not know who manages their PROs and how operational decisions are made”, which leads to conflicts of interest and limits the effectiveness of collection systems.

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„Producers should be responsible for and finance the entire waste collection and processing system, but appropriate criteria should be guaranteed. They should be confident about the legal compliance of the entities taking over their responsibilities. Unfortunately, it happens that organizations are set up by entities placing several dozen kilograms of electronics, and this is a legislative anomaly that should be changed.”

**Wojciech Konecki**, Association of Home Appliance Manufacturers – APPLiA Polska

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Adopting a model in which only producers and their representative industry organizations can establish and control a PRO brings a number of benefits:

- it protects the financial interests of those who actually bear the costs of the system,
- it ensures operational neutrality and freedom from pressure from treatment entities,
- it makes the system transparent,
- it strengthens the industry's position in a dialog with regulators and state administration,
- it reduces the gray market.

According to the authors of the study *National strategies for extended producer responsibility for sustainable management of waste electrical and electronic equipment (WEEE)* (Heikinheimo 2024), "lack of transparency in the ownership structure of PROs undermines the confidence of producers and weakens the legitimacy of the system."

*Only a transparent and understandable ownership structure can guarantee consistency of interests and the possibility of long-term planning.*

## PILLAR 2. NOT-FOR-PROFIT PRINCIPLE

The *not-for-profit* principle means that the PRO does not operate to maximize profits for its owners, but focuses on fulfilling its statutory obligations regarding the collection, treatment, and recycling of electronic waste, optimizing the costs of managing waste equipment, taking care of future obligations, and conducting educational activities.

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"PROs should operate on a not-for-profit basis and allocate profits to investments and statutory objectives, in particular education and ensuring future collection. This principle should apply to all entities at the PRO level so that any profits do not flow outside the system. I believe that potential dividends should continue to be allocated to education and the development of the recycling market, as APPLiA Polska does, for example."

**Wojciech Konecki**, Association of Home Appliance Manufacturers – APPLiA Polska

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According to the recommendations contained in the study *Designing and implementing extended producer responsibility under the EU Green Deal* (Mallick et al. 2024), the financing of EPR systems should support the achievement of environmental objectives rather than generate profit. As the authors emphasize, "in systems based on public value, financial surpluses should be reinvested in preventive measures, education, and systemic innovation."

The benefits of adopting the *not-for-profit* principle include:

- **system stability** – no dependence on variable market conditions, e.g. raw material prices,
- **financial transparency** – eliminating pressure to make a profit reduces the risk of cost manipulation,
- **increased public confidence** – consumers and producers can be sure that fees are actually used to achieve environmental goals,
- **cost efficiency** – no dividends means lower financial burdens for producers and ultimately for consumers (WEEE Forum 2025b).

By implementing the *not-for-profit* principle as a statutory requirement for all WEEE PROs, Poland could:

- stabilize the system for decades to come,
- reduce cost pressure on consumers,
- improve the quality of collection and treatment,
- strengthen the implementation of environmental objectives in the spirit of the EU circular economy.

The *not-for-profit* principle is not just a concept, but a proven mechanism for stabilizing the system.

A comparative study of national differences in the implementation of the WEEE Directive (Andersen 2022) clearly shows that *for-profit* PROs more often generate additional costs that do not translate into higher collection efficiency or service quality.

This allows to focus on achieving environmental and social goals, enhances the transparency of their operations, and builds lasting trust among both producers and consumers.

### PILLAR 3. FULL LEGAL AND FINANCIAL INDEPENDENCE OF PROS FROM TREATMENT FACILITIES

A key element of the model WEEE PRO is to ensure full independence from treatment facilities, both in terms of capital and operations. This means no ownership links and no influence of treatment facilities or their owners on decisions regarding the selection of contractors for collection, treatment, and recycling services.

This is one of the most important conditions for eliminating the risk of conflicts of interest or unfair competition, which can lead to a reduction in the efficiency of the system and the emergence of market pathologies.

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“Trust and business security depend on transparency – transparency of data, costs, masses, and recovery levels; organizational independence – separation of ownership of PROs and treatment plants to avoid conflicts of interest; and auditability and control – the possibility of external verification of the activities of PROs and treatment plants.”

**Tomasz Książek**, Signify Poland and Baltic States

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Experience with systems in which the treatment plant or its owners are shareholders in the PRO shows that the following often occurs:

- orders are directed to “own” facilities, regardless of their efficiency, costs, or quality of service;
- maximization of profits through the payment of dividends at the expense of reinvestment in the system, which limits the available financial resources and indirectly affects the increase in prices of new products, placing an unnecessary burden on consumers,
- lack of transparency in financial flows,
- creating barriers to entry for independent treatment plants, which limits competition and innovation (Executive Magazine 2025b).

In such cases, the PRO loses its status as a public trust, and as a result, both consumers and producers incur higher costs without achieving proportionally better environmental outcomes. As Heikinheimo notes, (2024) “When PROs have ownership ties to treatment facilities, the risk of cost manipulation, selective reporting, and inefficient collection increases.”

*Protection against conflicts of interest is the foundation of an effective extended producer responsibility model for WEEE.*

Experts (Mallick et al. 2024) point out that “multilevel conflicts of interest occur most often in systems where PROs are operationally or financially linked to treatment facilities,” leading to lower service quality and pressure to reduce costs at the expense of environmental performance. In turn, the European Court of Auditors (2021) emphasizes in its reports that the lack of separation of interests in EPR systems results in a decline in both environmental and economic efficiency.

*The separation of ownership and operations of PROs and treatment facilities is therefore a prerequisite for creating a fair, transparent, and efficient market.*

This allows the system to regain its operational independence, pursue overarching environmental goals in an objective and cost-effective manner, and gives producers real influence over environmental standards and the stability of the system’s operating costs.

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“Independent PROs are the cornerstone of the credibility of the entire system, as they eliminate conflicts of interest between the organization financing the obligations and the treatment facilities. They ensure full auditability of masses and settlements through regular audits, transparent methodologies, and clear reporting; they protect producers and consumers from fictitious masses, dumping, or the transfer of risks to honest market participants.”

**Michał Kanownik**, Chairman of Cyfrowa Polska Association

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## PILLAR 4. INCREASED MANDATORY CAPITAL – THE FOUNDATION OF SYSTEM STABILITY AND SECURITY

A safe and stable system for managing waste electrical and electronic equipment (WEEE) requires PROs to have sufficient mandatory capital to ensure their solvency, ability to meet their statutory obligations, and resilience to market fluctuations and crises.

The amount of share capital required for WEEE PROs in Poland – PLN 5 million – was set over 20 years ago and is now far from sufficient in relation to the scale of the market, which is worth over PLN 1,5 billion annually (Executive Magazine 2025b).

*Such a low threshold does not guarantee the organization's ability to bear financial responsibility in the event of operational errors, payment bottlenecks, or bankruptcy, which could destabilize the functioning of the entire system.*

Industry experts recommend increasing the minimum share capital to at least PLN 20 million and updating it periodically in line with market dynamics and inflation (Executive Magazine 2025b).

Many Western European countries apply similar capital requirements or their functional equivalents – e.g. mandatory bank guarantees, insurance, or maintaining a certain amount of liquid capital – which increases the stability and predictability of extended producer responsibility systems (Okopol et al. 2007). In some countries, including Poland, pursuant to Article 63 of the WEEE Act (Journal of Laws of 2015, item 1688), minimum equity capital amounting to at least half of the share capital must be maintained in a separate account, in the form of a term deposit or a bank or insurance guarantee. However, pathological and non-transparent financial transactions with related entities jeopardize the system of managing waste equipment.

It is recommended in the Polish model to:

- increase the minimum share capital of PROs to PLN 20 million,
- introduce a requirement to maintain at least 50% of this amount in liquid assets (e.g. deposits, guarantees),
- review and update the minimum values every 3–5 years,
- introduce a ban on granting loans and credits by PROs, in particular to entities with capital ties or owners.

*The lack of financial safeguards generates the risk of serious consequences in the event of the organization's insolvency – from disruptions in the functioning of the collection system, through delays in the fulfillment of environmental obligations, to the need to pass on costs to consumers.*

## PILLAR 5. TRANSPARENCY AND AUDITING

Transparency is the foundation of trust and effectiveness in any extended producer responsibility system, particularly in the area of waste electrical and electronic equipment (WEEE) management.

*The lack of reliable data on waste volumes, system costs, and financial flows prevents the fair distribution of responsibilities and costs, as well as effective control over the implementation of regulations.*

Transparency in reporting and supervision is therefore not only a matter of business integrity, but also a prerequisite for the effectiveness and stability of the entire WEEE EPR scheme in Poland.

“Regular access to information on the fulfillment of obligations is crucial, but remains limited in Poland. The features of the WEEE EPR scheme that build trust are transparency – clear accounting rules and access to data on collection and recycling levels, stability, predictable costs and no sudden regulatory changes and independent control – audits and administrative oversight that increase the credibility of the system. Transparent consultation and reporting mechanisms reduce the risk of inefficiency and abuse.”

**Zygmunt Łopalewski**, Beko Central Europe

### Recommended solutions in the Polish model:

- public disclosure of annual summary reports from the Waste Database with the possibility of sectoral analysis,
- introduction of mandatory, independent operational and financial audits in accordance with European standards WEEELABEX/EN 50625 (WEEELABEX i WEEE Forum 2019),
- ensuring access to selected aggregated analyses and reports for the purpose of planning activities and verifying partners.

### The importance of integration with the Waste Database

Reporting should be fully integrated with the Waste Database which will allow for:

- automatic monitoring and balancing of masses,
- early detection of anomalies (e.g. unnaturally low costs, sudden drops in mass, unjustified revenues, etc.),
- easy access to data for control authorities, e.g. the Environmental Protection Inspectorate, provincial marshals, or the Ministry of Climate and Environment (Journal of Laws 2015, item 1688).

### Modern digital tools

The inclusion of blockchain technology, described in Bułkowska’s study (2023, 9) as the technical “engine” of the Waste Database, could increase the system’s resistance to manipulation and ensure real-time data auditability.

Potential applications include: recording each delivery at collection points, tracking the flow of masses between system participants, providing auditors with immediate access to transaction logs, verifying mass and location data, and decentralizing records in producer registers.

*The inclusion of modern digital solutions in the BDO system would increase its transparency and the trust of stakeholders—producers, regulators, and consumers. It would also be the foundation of one of the most modern waste management control systems in Europe, which is in line with the objectives of the “Poland’s Digitalization Strategy until 2035 (Ministerstwo Cyfryzacji 2024).”*

## **PILLAR 6. CLEARING HOUSE – A CENTRAL COORDINATOR OF THE SYSTEM, INDEPENDENT OF PUBLIC ADMINISTRATION**

A central *clearing house* is a key administrative and analytical tool that ensures balance, transparency, and stability in extended producer responsibility (EPR) systems.

Comparative studies of WEEE collection models in Europe, conducted by researchers at the University of Padua, indicate that logistical efficiency – understood as a real reduction in costs and emissions – is only possible when the system is based on equal responsibility of PROs and central, but independent of state administration, coordination of the division of responsibilities. “Logistics efficiency is significantly higher in collective models, where the PRO is responsible for collecting entire WEEE streams or categories at the national level (Dieste et al. 2017, 10).”

*However, this does not mean nationalization of the system — on the contrary, it requires strong, professional, and independent PROs operating on the basis of stable and transparent rules.*

A *clearing house* is not a PRO, but a neutral, independent body or platform that:

- collects and balances data on the quantities of WEEE placed on the market and collected in the system,
- settles collection obligations between individual PROs,
- enables a fair and equitable distribution of common costs (e.g. education, maintenance of collection infrastructure, clearing of surpluses and shortages) (WEEE Forum 2020).

The introduction of an independent, central clearing house in Poland would bring a number of benefits:

- increased transparency of the system through centralization of data and reporting, which would facilitate regulatory control and market balancing,
- stabilization of the system with multiple PROs, which would eliminate the risk of excessive fragmentation and unfair competition,
- the possibility of using incentive tools, such as *bonus-malus* systems, which, as the example of France shows, support eco-design and effective collection (Légifrance 2014).

Implementing this solution in Poland would allow competition between PROs to be maintained while ensuring uniform quality standards, full transparency of masses and costs, and effective coordination of the system.

*A clearing house can be a tool that strengthens the system only if its transparency, independence, and clear rules for the allocation of responsibilities are guaranteed.*

*Otherwise, there is a risk that it will become a source of conflict, dumping practices, and unfair competition, leading to an erosion of trust in the entire system.*

## PILLAR 7. MANDATORY HANDOVER – MANDATORY TRANSFER OF WEEE TO CERTIFIED ENTITIES

One of the most effective tools for increasing the collection rate of waste electrical and electronic equipment (WEEE) and reducing the gray market is the *mandatory handover* principle – the obligation to transfer all WEEE waste exclusively to certified collectors or to collection points operating within the system that complies with the law. According to the analysis by Ilgemann et al. (2025), the Netherlands is one of the countries with the highest level of implementation of this solution in Europe. Thanks to the mandatory participation of producers and importers in the uniform Stichting OPEN system and strict reporting rules, a significant proportion of waste equipment enters the official circulation. The Dutch model effectively reduces parallel flows and minimizes the gray market, providing more complete knowledge about the flows of equipment placed as waste.

*Whether the mandatory handover principle actually increases collection and reduces the gray market depends not on its existence alone, but on the effectiveness of control, enforcement, and data integration mechanisms within the system (Ilgemann et al. 2025).*

In practice, this mechanism:

- eliminates uncontrolled waste flows,
- increases the volume of waste in the formal system,
- enables more effective and fairer cost allocation between PROs and producers (Okopol et al. 2007),
- minimizes the risk of the development of the gray market by limiting illegal collectors' access to valuable waste (Odpady i środowisko 2025, 13).

The system works on a simple principle: the end user does not bear the costs of transferring the equipment, and PROs, producers, and treatment plants operate according to clearly defined, transparent rules.

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“For entrepreneurs, activities in line with CE and EPR mean reputation and competitiveness – they are increasingly required by contractors, investors, and consumers, cost efficiency – recovering materials from WEEE can reduce production costs and dependence on primary raw materials, and regulatory compliance – meeting environmental obligations minimizes the risk of penalties and sanctions.”

**Tomasz Książek**, Signify Poland and Baltic States

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In Poland, the *mandatory handover* principle largely coincides with the current requirement to transfer WEEE to entities holding appropriate administrative decisions, e.g. permits for the collection of WEEE.

*The difference lies in the level of enforcement of this obligation and the introduction of systemic solutions that prevent the circumvention of legal collection channels.*

An inspiring example is the Dutch project of cooperation between PROs and the metal recycling sector as part of a *takeback* program. The program rewards scrap metal dealers and metal recyclers for transferring WEEE to certified treatment plants, which has enabled the legal recovery of an additional 42,000 tons of waste equipment per year (Ilgemann et al. 2025). In the case of the Netherlands, this corresponds to approximately 2.4 kg/

capita and represents 20% of the annual WEEE collection in that country. This approach not only increases the amount of waste entering the system, but also strengthens cooperation between industries that have previously operated in separate waste management streams.

## PILLAR 8. *ALL ACTORS* – SHARED RESPONSIBILITY OF ALL PARTICIPANTS IN THE SYSTEM

### Assumption

The *all actors* principle assigns clear roles and responsibilities to all entities that have access to WEEE or influence its fate – producers and PROs, retailers and e-commerce platforms, local governments, recyclers (including the scrap industry and plastics recyclers), secondary market and preparation for reuse entities, consumers, customs services, and supervisory authorities. It is one of the pillars of the new EU target architecture and a reference point for the review of the directive by 2026 (WEEE Forum 2025c). The rationale is that parallel flows undermine the effectiveness of the systems: in Europe, “leakages” total around 32% of WEEE generated (including scrap metal – around 13%, municipal waste – around 8%, illegal exports – around 5%, exports of waste equipment – approx. 6%) (Baldé et al. 2024; Deloitte and WEEE Forum 2025).

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„WEEE management - its collection, treatment, and recycling, as well as the management of secondary raw materials and initiatives to make the economy more circular - are social challenges that involve everyone. »All actors« principle should be adopted, recognizing the responsibility of everyone in the value chain who manages or has access to WEEE – producers, retailers, municipalities, recyclers, service providers, consumers, customs services, law enforcement agencies – for WEEE management and calling for cooperation.”

**Pascal Leroy**, Director General of WEEE Forum

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## Roles and responsibilities of all market participants

### PRODUCERS AND PROS

**Role:** main financiers and designers of the system; they contract and supervise collection and treatment services, ensure legal compliance and data consistency, contribute to nationwide coordination, and finance educational activities.

**Responsibilities:** register in the national register and report the quantities of equipment placed on the market, the mass of waste equipment collected and sent for treatment, and, where applicable, the flows of used and waste equipment in cross-border trade. They finance and organize collection and treatment in accordance with EN 50625/WEEELABEX standards, participate in the work of the clearing house coordinator, finance and conduct educational activities, and supervise contractors through contractual requirements and compliance audits. In the case of cross-border sales without a presence in the country, they appoint an authorized representative to perform their obligations, which limits the phenomenon of free riders. In accordance with EU law, they provide, free of charge, the information necessary to prepare for reuse and recycling for each type of new equipment (European Parliament and Council (EU) 2012, art. 15; WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## RETAILERS AND E-COMMERCE PLATFORMS

**Role:** first line of receiving waste equipment from residents and channel of information about return options; they organize reverse logistics and direct equipment to legal channels within the system.

**Responsibilities:** accept waste equipment from consumers on an “old for new” basis when selling new equipment and, in stores with a sales area of  $\geq 400 \text{ m}^2$ , also small equipment without the need to purchase. Ensure return to the system through collection on delivery, return points in stores or partner stores, and self-service devices. They provide clear information at the point of sale and online about the available options for returning equipment. They record and report the quantities of equipment accepted to the national registry or coordinator. They are subject to compliance audits and administrative sanctions in the event of violations. These obligations also apply to online sales and secondary market platforms (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## HOUSEHOLD USERS

**Role:** suppliers of the stream of waste equipment; they determine the quantity and quality of the equipment transferred by using legal channels and avoiding storing equipment at home.

**Responsibilities:** they return waste equipment only to legal channels (municipal collection points, retailers, collection upon delivery, self-service devices). They do not store functional or non-functional devices at home, but transfer them to the system or, if possible, to be prepared for reuse. They use information from municipal and national educational programs. Educational campaigns should be ongoing, measured by indicators, and financed by producer fees (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## WEEE TREATMENT FACILITIES AND RECYCLERS

**Role:** technological operators of the system; responsible for the safe and EN 50625/WEEELABEX-compliant treatment of waste equipment, dismantling and recovery of raw materials, as well as the transfer of mass data to the reporting system.

**Responsibilities:** they carry out collection, dismantling, recycling, and disposal processes in accordance with European regulations and standards. They ensure appropriate environmental protection conditions, use the required technologies, and keep full material records. They report the mass of equipment received and treated to the national registry or coordinator (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

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“It has become necessary for treatment plants to develop a uniform strategy and think ahead in terms of technological development. This is dictated by the constantly changing materials and products on the market. An example of this is small household appliances – a few years ago, they were mainly powered by mains electricity, but now we are seeing an increasing share of battery-powered appliances, which is forcing a change in processing methods for safety reasons.”

**Sebastian Królik**, President of the Management Board of Terra Recycling, Elemental Group

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## SCRAP SECTOR AND PLASTICS RECYCLERS

**Role:** system sealing node; they identify and separate waste electrical and electronic equipment found in the scrap stream and direct it to authorized processing facilities. They are also responsible for recovering plastics from equipment.

**Responsibilities:** detect and separate WEEE from the scrap stream, preventing it from being lost in informal channels. They transfer it only to facilities with the appropriate permits. They keep full records and report the mass of separated equipment and plastic materials to the national registry or coordinator (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## SECONDARY MARKET AND PREPARATION FOR REUSE

**Role:** extend the life of products and reduce waste generation; ensure transparency of equipment and waste flows (e.g. receipts, sales, repairs, transfers for recycling), including cross-border flows.

**Responsibilities:** They register and track equipment flows, including the number of devices received, sold, transferred for repair, reuse, or recycling. They report volumes and cross-border transactions of used and end-of-life equipment to the national registry or coordinator. They cooperate with PROs by providing information on equipment remaining in secondary circulation in order to include these quantities in the system balance and collection planning (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## LOCAL GOVERNMENTS

**Role:** organizers of local collection and communication infrastructure; they provide accessible collection points, conduct information campaigns, and cooperate operationally with PROs.

**Responsibilities:** they provide users from households with easy access to collection points (open and well-marked locations, clear hours and rules for handing over equipment). They maintain an adequate density and activity of the network (e.g. target: 1 point/2,000 users from households), including mobile collection and cooperation with PROs. They provide clear local information on the locations and rules for handing over equipment, including small appliances. They cooperate with PROs and recyclers in organizing collections and submit data to the national register or coordinator (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## SUPERVISORY AND CONTROL AUTHORITIES (NATIONAL REVENUE ADMINISTRATION, REGIONAL INSPECTORATE FOR ENVIRONMENTAL PROTECTION, TRADE INSPECTION)

**Role:** they enforce the law and standards at the border and within the country; they verify the classification of shipments, eliminate free riders, conduct inspections and impose sanctions, and ensure the reliability of data in the system.

**Responsibilities:** they conduct coordinated national and border inspections of the trade in used and waste equipment. They verify the eligibility of cross-border shipments (waste equipment vs. waste) and the completeness of documentation regarding origin, functional testing, and transport. They have permanent access to the national data register and operate according to uniform control and information exchange protocols. They enforce standards for preparation for reuse and recycling (including EN 50625/WEEELABEX, EN 50614), impose administrative decisions and penalties. They counteract parallel trade by stopping illegal exports, detecting violations of remote sellers' obligations, and eliminating *free riders* (WEEE Forum 2020; Deloitte and WEEE Forum 2025).

## JUSTIFICATION

The *all actors* approach distributes responsibility for the WEEE EPR scheme among all entities that have access to it or influence its fate: producers and PROs, retail and e-commerce, local governments, recyclers and the scrap sector, the secondary market, consumers, and customs and supervisory authorities. The authors of the report *Towards more meaningful and robust WEEE management targets* (2025) emphasize that this approach increases stakeholder engagement, facilitates the alignment of actions with national realities and final costs, and at the same time strengthens the implementation of circular economy objectives, including preparation for reuse, recovery of critical raw materials, and reduction of parallel flows. This approach is also beneficial from a



business perspective, as it allows tasks and costs to be shared among different groups, rather than placing the burden solely on producers, and provides metrics that reward actual services and results (Deloitte and WEEE Forum 2025).

*All market participants who manage or have access to waste electrical and electronic equipment are responsible for the effective management of this stream (WEEE Forum/Deloitte 2025).*

## PILLAR 9. MAINTAINING COMPETITIVENESS AND AVOIDING NATIONALIZATION OF THE SYSTEM

One of the key conditions for the sustainability and effectiveness of the waste electrical and electronic equipment (WEEE) management system is to maintain its **independent, industry-specific nature** and to rely on *not-for-profit* PROs.

*The model of state centralization or nationalization, understood as the public administration or state monopoly taking direct responsibility for the collection and recycling of WEEE, has a number of negative environmental, economic, and organizational effects.*

The model should assume that:

- the WEEE EPR scheme is managed by independent PROs acting on behalf of and for the benefit of producers, under state supervision but without direct operational interference (Okopol et al. 2007),
- the role of the state is limited to setting targets, supervision, and enforcement, rather than monopolization or operational management (Deloitte and WEEE Forum 2025).

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“The nationalized EPR system is contrary to the idea of extended producer responsibility: public authorities would run the EPR system, and producers would be required to sign a contract without having any influence on its shape and would have no incentive to reduce waste management costs, improve product design, or promote circularity. The key to EPR is that producers retain control over the costs of managing their products at the end of their life.”

**Pascal Leroy**, Director General of WEEE Forum

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Experience from Hungary shows that centralization and nationalization of extended producer responsibility systems:

- led to a sharp increase in costs – by as much as 300% in the case of Hungary (Przegląd Komunalny 2021),
- reduced environmental efficiency through a decline in collection and recycling rates,
- and limited innovation and private investment in infrastructure and technologies.

The Hungarian model, in which the extended producer responsibility system was transferred to a single state entity, has been criticized by industry and international organizations, including the OECD (2023) and the European Anti-Fraud Office (OLAF) (2022).

*The nationalization of the WEEE EPR scheme in Hungary has resulted not only in higher costs for producers, but also in reduced flexibility and low collection efficiency.*

For Poland, this means that the following principles must be incorporated into the system model:

- maintaining the pluralism of PROs and competitiveness under central supervision,
- maintaining financing and control mechanisms by producers,
- avoiding solutions leading to full centralization and loss of control by the industry.

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*"In the light of the experiences of European EPR systems, we recommend maintaining organizational pluralism and enabling competition between organizations, which promotes the effective use of funds and innovation. The optimal model is a system managed in partnership with organizations created by entrepreneurs, while maintaining mechanisms of competition and transparency."*

**Piotr Mazurek**, expert of Konfederacja Lewiatan

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## **PILLAR 10. CREATION AND STABILIZATION OF THE MARKET FOR RECYCLED RAW MATERIALS (SUBSIDIES FOR RECYCLED MATERIALS, TAX BREAKS, PROMOTION OF USE)**

A stable system for managing waste electrical and electronic equipment that is also resistant to market fluctuations requires mechanisms that support the profitability of using secondary raw materials. One of the most effective tools may be a system of subsidies for recyclates from WEEE waste. Its aim is to equalize the price difference between recyclates and primary raw materials.

*When the cost of recycled materials exceeds the price of virgin materials, financial support can prevent market destabilization and increase the share of secondary materials in industrial production.*

Market data from the *Plastics Recyclers Europe report* (2024) show that in 2023:

- total installed plastic recycling capacity in the EU amounted to 13.2 million tons (an increase of 6%, compared to 10% in 2022 and 17% in 2021),
- industry revenues fell by 12.5% to €9.1 billion,

- investments halved from €1 billion in 2022 to €0.5 billion in 2023,
- many facilities were closed due to falling demand, high energy costs, and competition from cheaper virgin and imported raw materials.

The WEEE recycling industry also faces technological barriers. The high complexity of modern devices, the presence of multilayer materials, and the need to remove lithium batteries increase the costs of dismantling and processing (PARP 2025).

At the EU level, solutions supporting the recycled materials market are being implemented:

- The Action Plan for the Circular Economy (2020) covers the electronics and ICT, packaging, batteries, and plastics sectors, including device return systems and the obligation to facilitate dismantling (European Commission 2020),
- The Packaging Regulation (PPWR) introduces a minimum recycled content for plastic packaging – 30% from 2030 and 65% from 2040 (European Parliament and Council (EU) 2025),
- Circular Electronics Initiative – in its resolution of February 10, 2021, on the new Action Plan for the Circular Economy, (European Parliament 2021) the European Parliament expressed its support for the Circular Electronics Initiative, calling for increased durability, modularity, the use of recycled materials in electronics, easier disassembly, access to spare parts, upgradability of devices, better recycling infrastructure, and mandatory certification of e-waste recyclers.

*Poland currently lacks mechanisms that would equalize the cost difference between recycled materials and virgin materials. There are subsidy instruments for the recycling sector, but they do not include direct support for the demand for recycled materials.*

The introduction of such a solution will bring measurable benefits:

- it will remove the price barrier hindering the use of recycled materials,
- it will stabilize the WEEE treatment sector,
- it will stimulate investment in critical raw material recovery technologies,
- it will increase the chances of achieving circular economy goals,
- it will reduce the risk of WEEE waste ending up in the gray market.

The system of subsidies for WEEE recyclates should be implemented in parallel with collection obligations, transparent reporting, and higher processing requirements. It can serve as an effective instrument for fostering the secondary raw materials market and for genuinely strengthening the circularity of the electronic equipment recovery system in Poland

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„Today, we all feel responsible for the environment. That is why the reliability of PROs is an important aspect. We must be sure that the collection obligation will be carried out properly and effectively. However, it is not only a question of whether, but also how. Waste equipment is a source of many valuable elements – the cobalt in our televisions comes 100% from old, recycled devices.”

**Piotr Stelmachów**, VP, Head of Consumer Electronics at Samsung Electronics Polska

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## PILLAR 11. ENVIRONMENTAL EDUCATION

An effective system for managing waste electrical and electronic equipment requires conscious and active participation from consumers.

*A key condition for the success of the extended producer responsibility concept in the field of WEEE is systematic, reliable education and the development of pro-environmental attitudes.*

A model WEEE PRO should ensure the obligation to conduct professional, long-term educational campaigns financed by fees paid by producers.

“Environmental education in the area of WEEE is not an addition to the system, but its foundation. Without it, even the best-designed legal and logistical mechanisms will not be fully effective. It is the knowledge, awareness, and daily decisions of consumers that determine whether e-waste—containing valuable metals and critical raw materials—will become a source of raw materials for the economy of the future.”

**Maria Andrzejewska, Director of UNEP GRID-Warsaw**

In the recommended model, education should be based on the following principles:

- **Financing obligation** – PROs allocate a specified portion of their revenues to nationwide, long-term educational programs aimed at bringing about lasting changes in habits and raising environmental awareness.
- **Implementation by independent entities** – campaigns run by specialized organizations such as foundations, educational agencies, or research institutes, which guarantees their neutrality and professionalism.
- **Cooperation with stakeholders** – local governments, schools, media, and non-governmental organizations are involved in educational activities to increase the reach and effectiveness of the message.
- **Innovation and digitization** – using new media, digital tools, gamification elements, and collaboration with influencers to reach different social groups.
- **Evaluation and transparency** – systematic examination of campaign effectiveness and public reporting of results.

Pursuant to Article 62 of the WEEE Act (Journal of Laws 2015, item 1688), PROs are currently required to allocate a minimum of 5% of their net revenues to educational campaigns.

The recommended model assumes four pillars of education:

- **nationwide programs** – addressed to all social groups, with particular emphasis on young people, seniors, and people at risk of digital exclusion,
- **local education** – supporting municipalities, schools, and social organizations in building knowledge at the local community level,
- **modern forms of communication** – the use of digital media, interactive tools, and gamification elements,
- **constant presence in the public space** – cooperation with the media, local governments, and the private sector to reinforce educational messages.

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„Consumer awareness and education are absolutely crucial – they are the second engine of the system’s success, alongside supervision. Without systematic and substantive information for the public, it will not be possible to achieve ambitious collection targets. Education cannot be limited to marketing – it must explain the real environmental and economic benefits, debunk myths, point out convenient ways to return equipment, and promote a circular economy.”

**Michał Kanownik**, Chairman of Cyfrowa Polska Association

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## **PILLAR 12. LEGISLATION AND PARTICIPATION IN INTERNATIONAL ORGANIZATIONS – A GUARANTEE OF THE SYSTEM’S DEVELOPMENT AND STABILITY**

The waste electrical and electronic equipment (WEEE) management system operates in a dynamic, multi-level regulatory environment that is constantly evolving under the influence of EU policies, including the European Green Deal, the Circular Economy Package, the amendment to the WEEE Directive – and growing requirements in the areas of eco-design, recovery of critical raw materials, ESG, and the extension of EPR to further product groups (European Commission 2025c).

*A model WEEE PRO should not only comply fully with applicable law, but also actively participate in its co-creation, interpretation, and implementation.*

The model includes, in particular:

- participation in public consultations and legislative processes at the national and EU levels,
- preparation of analyses, reports, and recommendations supporting the development of the system,
- cooperation with public administration as a subject matter expert and source of reliable data,
- participation in research and development projects and standard-setting processes.

A key element of the system’s stability and development is **membership in international industry organizations** such as the WEEE Forum, EucoLight, EERA, and CENELEC. This ensures, among other things:

- **access to best practices** – thanks to the exchange of experiences with over 50 member organizations of the WEEE Forum, it is possible to quickly implement innovative solutions in the areas of collection, treatment, education, and financial management,
- **influence on European standards** – participation in the development of standards, including the EN 50625 series regulating the quality of WEEE treatment throughout the EU,
- **regulatory security** – ongoing access to interpretations of regulations and the ability to prepare for changes minimizes legal risk,
- **financial stability** – cooperation within pan-European compliance and cost benchmarking systems allows for the optimization of financing models and reduces the risk of unforeseen fee increases or incurring unjustified costs,
- **compliance with CE and ESG objectives** – participation in European projects supports the adaptation of the national system to new environmental and social requirements.

It is worth noting that membership in structures such as the WEEE Forum or EucoLight is not a formality.

*These international organizations require their members to meet strict ethical and organizational criteria, including representing the interests of producers and consumers and maintaining complete independence from treatment plants (WEEE Forum, 2019b; EucoLight, 2025).*

“Trust and business security among producers are built primarily on the transparency and compliance of the WEEE EPR scheme with legal regulations. Reliable reporting, the ability to audit the activities of PROs, and effective control of the flow of equipment and waste are of key importance. Regulatory stability and clarity of requirements are also important, as they allow for long-term planning.”

**Marek Maksymiuk, BSH Polska**



## The stability of the system depends on its pillars

The proposed order and arrangement of the pillars correspond to the key challenges of a modern extended producer responsibility system for electrical and electronic equipment. Taking them into account both today and in future legislation will make it possible to create cost-effective solutions for producers and consumers, as well as meet the challenges of the circular economy. The proposed solutions will also increase raw material security and reduce dependence on countries that currently extract strategic elements. This will also reduce pressure on the environment and take into account the perspectives of all market stakeholders.

### PILLARS 1–4 (FOUNDATION OF ORDER AND STABILITY)

The basis of the modern WEEE EPR scheme is formed by: a clear and controllable ownership structure ensuring real representation of manufacturers, the *not-for-profit* principle guaranteeing the reinvestment of surpluses in systemic and educational goals, full legal and financial independence of the PRO from treatment plants, and increased mandatory capital (min. PLN 20 million). This arrangement reduces conflicts of interest, stabilizes costs, and builds operational resilience, enabling long-term planning of investments in collection, logistics, and recycling.

### PILLARS 5–7 (BACKBONE: DATA, COORDINATION, SYSTEM TIGHTENING)

Transparency and auditing (mandatory reporting to the Waste Database, public access to data, regular inspections) create a reliable information base for supervision and benchmarking. This data is used by the *clearing house* – a central coordinator, independent of the administration, which distributes responsibilities and costs and harmonizes operating standards.

This is complemented by the *mandatory handover* principle, which directs WEEE exclusively to authorized entities, limiting parallel flows and closing the loop in the official system.

### PILLARS 8–10 (MARKET RULES AND CIRCULAR ECONOMY)

The shared responsibility of all participants – from consumers to producers, collectors, treatment plants, and PROs – clarifies roles and objectives. Maintaining competitiveness and avoiding nationalization protects against the negative effects of monopoly (increased costs, decreased quality, risk of politicization), while maintaining pressure for efficiency. The circular economy is closed by stabilizers of demand for recycled materials: a subsidy system, tax breaks, and other mechanisms promoting the use of recycled raw materials in production.

### PILLARS 11–12 (SUSTAINABILITY: BEHAVIORAL CHANGE AND INTERNATIONAL STANDARDS)

Effective education, carried out by independent entities, increases awareness and accessibility of proper WEEE disposal channels, strengthening compliance with *mandatory handover* and reducing the gray market. At the same time, active participation in legislative work and international organizations enables the continuous transfer of best practices, compliance with EU standards, and rapid adaptation of the system to technological and market changes – all of which together sustain the long-term efficiency and credibility of the system.



## Summary

The implementation of a model WEEE PRO based on twelve pillars will enable Poland to build a system that is:

- **stable, transparent, and cost-effective**, in line with best practices in Europe, **resistant to nationalization and politicization**, thanks to the preservation of pluralism of independent, industry-specific PROs operating on a not-for-profit basis,
- **focused on environmental goals**, including the recovery of critical raw materials, high-quality recycling, and the development of the repair and reuse sector.

The adoption of the recommended solutions will ensure:

- full transparency of costs and material and financial flows,
- optimization of total system costs for producers,
- a reduction in financial risks by increasing mandatory capital and eliminating conflicts of interest,
- the strengthening of the circular economy (CE) and the achievement of EU targets for CRM collection and recovery levels.

The system should clearly exclude centralization in the hands of public administration or quasi-state entities. It is essential to:

- consolidate the *not-for-profit* model in legislation,
- ensure the mandatory participation of actual producers in the shareholding structure of PROs and their regular verification,
- maintain the role of the market as the pillar of the system, with public supervision but without central management of finances and logistics,
- ensuring the transparency of the system and the availability of aggregated market data,
- create opportunities for small and new entities to develop within the waste equipment management system.



# 5 ELEKTROEKO – ITS ROLE AND SIGNIFICANCE IN THE POLISH WEEE EPR SCHEME



# Twenty years of shaping the direction of the industry

In 2026, ElektroEko will celebrate its 20th anniversary of operating on the Polish market of waste electrical and electronic equipment (WEEE) (ElektroEko 2025b).

*The organization, established by the largest manufacturers and importers of household appliances, audio/video/IT equipment, and lighting, has been pursuing its mission of building a stable, effective, and transparent WEEE EPR scheme in Poland from the very beginning, acting on behalf of producers (InfoProdukt 2025e).*

This way of operating a PRO is consistent with the conclusions of comparative analyses of the implementation of the WEEE Directive in Europe: “systems in which producers have an influence on the management of the PRO are characterized by **“lower costs and higher operational efficiency and greater stakeholder confidence”** (Andersen 2022).

- Between 2006 and 2025, ElektroEko - in its own projects and in cooperation with treatment plants—collected and sent over 1.8 million tons of WEEE for treatment.
- Advanced IT tools (EkoMaster, BlackBox) are implemented, and information security is confirmed by ISO/IEC 27001 certification (ElektroEko 2022).

A transparent financial model and constant cost control on the part of the organization acting on behalf of manufacturers have translated into measurable economic effects.

*According to ElektroEko’s estimates, the organization’s activities have enabled customers **to save a total of over PLN 200 million** (InfoProdukt 2025e).*

ElektroEko has allocated a total of PLN 782 million to the collection and treatment of waste equipment, thus supporting the continuous development of the largest treatment plants in the country. The organization has also repeatedly acted as a consultant in the creation of new legislative solutions, both at the national level and in the European Union.

|                      |                                                                                                                                                                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scale and continuity | the largest volume of WEEE handled and uninterrupted presence on the market for 20 years                                                                            |
| Transparency         | an organization established and controlled exclusively by the producers and their industry organizations                                                            |
| Innovation           | consistent digitization of processes and financial flows from the very beginning of operation – while maintaining certified data security standards (ISO/IEC 27001) |
| Systemic impact      | integration of collection, education, and circular economy elements, in line with EU best practices                                                                 |

Table 4. ElektroEko – market leader for twenty years

## Leader in environmental education

### EDUCATION AS THE FOUNDATION OF THE WEEE EPR SCHEME

Since 2006, ElektroEko has been consistently developing educational activities, treating them as a key element of an effective system for managing waste electrical and electronic equipment. The first mobile electronic waste collection points were launched in Warsaw in 2007, a free service for the collection of large electronic waste from homes was introduced in 2013, and since 2022, the organization has been developing a system of publicly accessible containers for small WEEE.

The first initiatives, such as the “Every student knows what to do with WEEE” program and the interactive exhibition “Two Worlds of Electronic Waste,” laid the foundation for building an environmental education system in this area. Their experiences have enabled the creation of further long-term projects that respond to contemporary challenges.

ElektroEko’s flagship project is the “My City Without Electronic Waste” program, which has been running for thirteen years in educational institutions and local communities throughout Poland. Over 3,700 teachers and coordinators joined the program, and the Education Fund allocated nearly PLN 3.3 million for awards, additional equipment for schools, and support for local initiatives. Since the initiative began, approximately 10 million kilograms of WEEE have been collected (MMbE 2025). The program shows that education can go hand in hand with real environmental effects, while supporting the circular economy and responsible consumption.

*For over two decades, ElektroEko has implemented dozens of projects involving millions of Poles, shaping environmental awareness and promoting the proper handling of electronic waste (elektrosmieci.pl 2025).*

The second pillar of ElektroEko’s educational activities is International E-Waste Day, organized since 2018 in cooperation with the WEEE Forum and UNEP/GRID-Warsaw. In Poland, hundreds of organizations, institutions, and thousands of participants join the initiative every year. Educational campaigns, waste equipment collections in companies, schools, and public institutions, as well as materials provided to participants promote responsible consumer attitudes and increase the volume of electronic waste entering the official system (GIOŚ 2024).

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„ElektroEko, which has been running social campaigns and educational projects for years, has built recognition and credibility in Poland, while changing the way millions of people think about electronic waste. More and more consumers no longer treat waste equipment as trash, but as waste that requires proper handling.”

**Maria Andrzejewska, Director of UNEP GRID-Warsaw**

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The events are also accompanied by artistic activities, including the creation of Poland’s first ecological educational mural in the center of Warsaw, made with photocatalytic paints that neutralize air pollution (Noizz 2021). In 2024, over 200 organizations took part in International E-Waste Day in Poland (Biznes Polish Press Agency 2024).

### MODERN FORMS AND LASTING EFFECTS

ElektroEko’s nationwide educational programs are complemented by the ElektroEkologia Center in Warsaw – an interactive educational space for young people aged 13–18, operating since 2021. By 2025, the Center

had hosted over 19,000 students from all over Poland, who participated in nearly 800 stationary and online workshops. Classes include practical tasks, simulations, and educational games, as well as special events such as eco-hackathons and the “Electro-Eco School” competition. The program teaches the principles of circular economy, recycling, urban mining, and recovery of raw materials from electrical and electronic equipment (Centrum Elektroekologii 2025).

ElektroEko systematically monitors the effectiveness of its activities. Subsequent editions of surveys conducted by reliable research institutions on a representative group of respondents confirm a gradual increase in public awareness in this area (MillwardBrown SMG/KRC 2006; GfK Polonia 2019; 2023). The results of the analyses form the basis for improving programs and tailoring educational tools to the needs of the audience, which increases the effectiveness of communication and operational activities.

Commitment to environmental education has been recognized with numerous awards and distinctions. In 2025, ElektroEko received the Forbes Diamonds award and the title of Responsible Recycling Leader as part of the Sustainable Economy Diamond award (Executive Magazine 2025c; InfoProdukt 2025a).

*ElektroEko is a multiple winner of prestigious awards and distinctions, including: Ekolaury of the Polish Chamber of Ecology, Gazele Biznesu, Business Credibility Certificate, “Environmentally Friendly” award, and second place in the “Odpowiadam Polsce” Socially Responsible Companies Ranking (ElektroEko 2025b).*

ElektroEko’s educational and social initiatives were presented in four consecutive editions of the prestigious report “Responsible Business in Poland. Good Practices” published annually by the Responsible Business Forum (FOB 2025)

## ElektroEko as a recognized expert in the WEEE industry in Poland and internationally

ElektroEko’s strong market position is also the result of its active presence in key industry and economic organizations. ElektroEko is a member of:

- Business Centre Club,
- Konfederacja Lewiatan,
- Environmental Protection Committee of the Polish Chamber of Commerce,
- WEEE Forum,
- EucoLight.

ElektroEko actively participates in legislative and consultation processes at the national and EU levels, representing the Polish industry in the WEEE Forum – the largest international network of producer responsibility organizations, bringing together 51 members from around the world (**WEEE Forum 2019a**).

*WEEE Forum co-creates reports and positions shaping the future of extended producer responsibility (EPR) systems, promoting standards of transparency, auditability, and full producer responsibility for the product life cycle..*

As part of the work of the WEEE Forum, ElektroEko participated, among other things, in the preparation of the report *Towards more meaningful and robust WEEE management targets* (Deloitte and WEEE Forum 2025),

which pointed to the need to move away from one-dimensional collection targets in favor of a comprehensive approach that also includes the recovery of critical raw materials, prevention, and education – in line with the assumptions of the new EU Circular Economy Act (European Commission 2025b).

The data from *Global E-waste Monitor 2024* show that Europe has the highest WEEE collection rate in the world (42.8%), (Baldé et al. 2024), but challenges related to the growing amount of e-waste, legislative gaps, and cost balance remain. Thanks to its stable operating model, ElektroEko supports the development of more sustainable ROP systems in Europe (WEEE Forum 2025b). It emphasizes the importance of maintaining independence from treatment plants and avoiding centralization and nationalization of the system – as exemplified by the negative experience in Hungary (OLAF 2022).

## ElektroEko S.A. shareholders

ElektroEko S.A.'s shareholders represent the most important segments of the electrical and electronic equipment market in Poland, ensuring a deep understanding of the specific nature of individual industries and effective representation of the interests of distributors and their customers. The company is made up of the largest industry employer organizations and leaders in the household appliances, audio/video, IT, and lighting sectors, who combine many years of experience with the highest standards of operation.

### APPLIA POLSKA

APPLiA Polska is an association of household appliance employers representing manufacturers and importers of household appliances in Poland. The organization, which since 2004 (initially as CECED Polska) has been building its position as a center for research and analysis of the household appliances industry, is the main shareholder of ElektroEko S.A. APPLiA Polska brings together 35 companies representing over 50 well-known household appliance brands that market a wide range of products, from large appliances such as refrigerators, dishwashers, and washing machines to small appliances and Care and Beauty and Home Comfort equipment. As an expert in energy efficiency and circular economy, the organization actively participates in social dialogue and industry standardization (APPLiA Polska 2025).

### CYFROWA POLSKA ASSOCIATION

The Cyfrowa Polska Association is a non-profit industry organization of employers bringing together the largest companies in the audio/video and IT industries operating in Poland, including manufacturers, importers, and distributors of electrical and electronic equipment. Founded in 2005, the organization specializes in specific issues defined by its members based on the challenges they encounter in their daily activities. The Association is a 30% shareholder in ElektroEko S.A. (Związek Cyfrowa Polska 2025).

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„For two decades, Cyfrowa Polska Association – a representative of the digital industry and a shareholder of ElektroEko – has been co-creating a model of extended producer responsibility in Poland, combining market efficiency with transparency and public trust. The model based on independent, transparent PROs, supported by digital oversight and strong education, ensures cost stability, guarantees high-quality processing, and builds public trust.”

**Michał Kanownik**, Chairman of Cyfrowa Polska Association

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## SIGNIFY POLAND SP. Z O.O. AND LEDVANCE SP. Z O.O. – LEADERS IN THE LIGHTING INDUSTRY

The lighting sector at ElektroEko is represented by two global leaders: **Signify** – a world leader in lighting, providing solutions to both professional customers and consumers, and **Ledvance** – a brand with over a century of experience, spun off from OSRAM in 2016 (Signify 2025; Ledvance 2025).

As ElektroEko's shareholders both entities bring extensive experience in innovative lighting technologies and in-depth knowledge of the specifics of this market segment. Their presence ensures that the interests of the entire lighting industry are represented in the e-waste management system.

The shareholders of ElektroEko S.A. thus represent the most important segments of the e-waste market in Poland, ensuring comprehensive coverage of the industries responsible for placing electrical and electronic equipment and lighting on the Polish market.

### Summary: 20 years of responsibility and trust

*Over the past twenty years, ElektroEko has established itself as a PRO which not only meets but also sets standards for WEEE management in Poland.*

Its distinguishing features remain financial transparency and measurable effectiveness in education and e-waste collection. Membership in the WEEE Forum and EucoLight, as well as active participation in legislative processes, allow ElektroEko to have a real impact on the shape of the producer responsibility system at the national and EU levels (InfoProdukt 2025c).

*The ElektroEko operating model, as an organization unrelated to treatment plants and reinvesting funds in educational activities and system development, is consistent with the direction advocated by experts and scientists on the international stage.*

According to the conclusions of Mallick et al. (2024), only such organizations "create long-term public value and minimize systemic risks through transparency, independence, and compliance with environmental objectives."



| CRITERION                                                                                                              | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ownership structure</b>                                                                                             | An organization established and controlled by producers – manufacturers of electrical and electronic equipment.                                                                                                                                                                                                                                                                         |
| <b>Independence</b>                                                                                                    | No capital ties with treatment plants – elimination of conflicts of interest.                                                                                                                                                                                                                                                                                                           |
| <b>Experience</b>                                                                                                      | Almost 20 years of continuous operation in the Polish WEEE EPR scheme, including periods of legislative and institutional reforms.                                                                                                                                                                                                                                                      |
| <b>Cost efficiency</b>                                                                                                 | Over PLN 200 million in savings for the industry – the result of optimizing collection and processing costs.                                                                                                                                                                                                                                                                            |
| <b>Education and public awareness</b>                                                                                  | Expenditure on education exceeded PLN 53 million.                                                                                                                                                                                                                                                                                                                                       |
| <b>Participation in industry debates</b>                                                                               | Active participant in public consultations and analyses concerning the future of the system.                                                                                                                                                                                                                                                                                            |
| <b>Co-author and funding organization of nationwide social and statistical research on the WEEE industry.</b>          | A series of public opinion polls conducted on a representative group of respondents entitled Waste Electrical and Electronic Equipment – knowledge and attitudes in Poland (MillwardBrown SMG/KRC 2006; GfK Polonia 2019; 2023).                                                                                                                                                        |
| <b>Organizer of lectures and training courses for employees of Regional Inspectorates for Environmental Protection</b> | Presentation of the capabilities and effectiveness of a modern ICT system for tracking, managing, and reporting the flow of electrical and electronic equipment, using the Ekomaster system as an example. Training for inspectors on identified irregularities and abuses in the WEEE EPR scheme, and recommendations on conducting inspections and areas requiring special attention. |
| <b>International membership</b>                                                                                        | The only WEEE PRO in Poland affiliated with the WEEE Forum – a network of extended producer responsibility organizations for electrical and electronic equipment – recognized as an expert by the European Commission.                                                                                                                                                                  |

Table 5. Distinguishing features of ElektroEko WEEE compliance scheme as a public trust organization



# Bibliography

**About Hungary.** 2022. „Hungary’s Waste Management System Transforms from next July”. <https://abouthungary.hu/news-in-brief/hungarys-waste-management-system-transforms-from-next-july>.

**ADEME.** 2025. „ADEME, the French Agency for Ecological Transition”. The French Agency for Ecological Transition. <https://www.ademe.fr>.

**Andersen, Terje.** 2022. „A Comparative Study of National Variations of the European WEEE Directive: Manufacturer’s View”. „Environmental Science and Pollution Research” 29(14). <https://doi.org/10.1007/s11356-021-13206-z>.

**APPLiA Polska.** 2025. „APPLiA Polska | O nas”. <https://APPLiA.pl/o-nas/>.

**Baldé, C. P., M. Wagner, G. Iattoni, R. Kuehr.** 2020. „In-Depth Review of the WEEE Collection Rates and Targets”. United Nations Institute for Training and Research (UNITAR).

**Baldé, Cornelis P., R. Kuehr, T. Yamamoto et al.** 2024. „Global E-waste Monitor 2024”. International Telecommunication Union (ITU) and United Nations Institute for Training and Research (UNITAR). [https://ewastemonitor.info/wp-content/uploads/2024/03/GEM\\_2024\\_18-03\\_web\\_page\\_per\\_page\\_wb.pdf](https://ewastemonitor.info/wp-content/uploads/2024/03/GEM_2024_18-03_web_page_per_page_wb.pdf).

**„BDO”.** 2025. Strona główna. Baza Danych o Produktach i Opakowaniach oraz O Gospodarce Odpadami. <https://bdo.mos.gov.pl/>.

**Biznes Polish Press Agency.** 2024. „Wytrop z nami elektrośmieci”. <https://biznes.pap.pl/wiadomosci/elektronika/wytrop-z-nami-elektrosmieci-mediroom>.

**Bułkowska, K., M. Zielińska, M. Bułkowski.** 2023. „Implementation of Blockchain Technology in Waste Management”. „Energies” 16(23). <https://doi.org/10.3390/en16237742>.

**Bundesumweltministeriums.** 2022. „Welche Rolle spielt die Stiftung elektro-altgeräte register (Stiftung ear)? – BMUKN – FAQ”. <https://www.bundesumweltministerium.de/FA136>.

**CdC RAEE.** 2007. „CdC RAEE | Il portale del Centro di Coordinamento RAEE”. <https://www.cdcraree.it/>.

**CENELEC.** 2017. „European Standards for Waste Electrical and Electronic Equipment (WEEE)”. [https://www.cenelec.eu/media/CEN-CENELEC/AreasOfWork/CEN-CENELEC\\_Topics/Environment%20and%20Sustainability/Quicklinks%20General/Documentation%20and%20Materials/weee-brochure.pdf](https://www.cenelec.eu/media/CEN-CENELEC/AreasOfWork/CEN-CENELEC_Topics/Environment%20and%20Sustainability/Quicklinks%20General/Documentation%20and%20Materials/weee-brochure.pdf).

**Centrum Elektroekologii.** 2025. „Centrum ElektroEkologii”. <https://www.centrumelektroekologii.pl/home>.

**Circle Economy, Instytut Innowacji i Odpowiedzialnego Rozwoju INNOWO i Natural State.** 2022. „THE CIRCULARITY GAP REPORT POLAND 2022”. Ministerstwo Funduszy i Polityki Regionalnej. [www.circle-economy.com](http://www.circle-economy.com). [https://www.eog.gov.pl/media/111457/20220927\\_CGR\\_Poland\\_Report\\_t\\_210x297mm.pdf](https://www.eog.gov.pl/media/111457/20220927_CGR_Poland_Report_t_210x297mm.pdf).

**Deloitte and WEEE Forum.** 2025. „Report: Towards More Meaningful and Robust WEEE Management Targets”. [https://weee-forum.org/ws\\_news/deloitte-study-towards-more-meaningful-and-robust-weee-management-targets/](https://weee-forum.org/ws_news/deloitte-study-towards-more-meaningful-and-robust-weee-management-targets/).

**Dieste, M., A.F. Viagi, R. Panizzolo, S. Biazio,** University of Padova, Italy. 2017. „A Comparison of Different Models for Collection of WEEE in Europe”. „International Journal of Environmental Science and Development” 8(8). <https://doi.org/10.18178/ijesd.2017.8.8.1021>.

**Dz. U.** z 2005 r. Nr 180 poz. 1495. Ustawa z dnia 29 lipca 2005 r. o zużyciu sprzętu elektrycznym i elektronicznym. <https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20051801495>.

**Journal of Laws 2015, item 1688.** Ustawa z dnia 11 września 2015 r. o zużyciu sprzętu elektrycznym i elektronicznym.

**Dz. U.** z 2017 r. poz. 1499. Rozporządzenie Ministra Środowiska z dnia 21 lipca 2017 r. w sprawie minimalnych rocznych poziomów zbierania zużytego sprzętu elektrycznego i elektronicznego. <https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20170001499>.

**Dz. U.** z 2023 r. poz. 1587. Ustawa z dnia 14 grudnia 2012 r. o odpadach. <https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20230001587>.

**Dz. U.** z 2024 r. poz. 573. Ustawa z dnia 11 września 2015 r. o zużyciu sprzętu elektrycznym i elektronicznym – tekst jednolity. <https://isap.sejm.gov.pl/isap.nsf/download.xsp/WDU20240000573/T/D20240573L.pdf>.

**DZP.** 2012. „Nowa Dyrektywa WEEE”. Blogi Kancelarii Domański Zakrzewski Palinka. <https://www.dzp.pl/blog/srodowisko/gospodarka-odpadami/nowa-dyrektywa-weee>.

**EAA.** 2022. „Early Warning Assessment Related to the 2025 Targets for Municipal Waste and Packaging Waste – Hungary”. European Environment Agency. <https://www.eea.europa.eu/publications/many-eu-member-states/hungary&ved=2ahUKEwiE-6fVnfiOAxU7HxAlHfVkc3wQFnoECBkQAQ&usq=AOvVaw1RMmsDY0YdDvzShRxBXKH>.

**EAK-Austria.** 2023. „Startseite | Elektroaltgeräte Koordinierungsstelle Austria GmbH”. <https://www.eak-austria.at/>.

**EEA.** 2025. „Hungary Profile on Municipal and Packaging Waste Management – 2025”. <https://www.eea.europa.eu/en/topics/in-depth/waste-and-recycling/municipal-and-packaging-waste-management-country-profiles-2025/hu-municipal-waste-factsheet.pdf>.

**Eko360.pl.** 2024. „Edukacja ekologiczna w praktyce – kampanie, które trafiają w potrzeby odbiorców ■ Ekologia na co dzień – blog ekologiczny”. Ekologia na co dzień – blog ekologiczny. <https://eko360.pl/edukacja-ekologiczna-w-praktyce-kampanie-ktore-trafiaja-w-potrzeby-odbiorcow/>.

**ElektroEko.** 2022. „Dla wprowadzających”. Dla wprowadzających. <https://www.elektroeko.pl/nasza-oferta/dla-wprowadzajacych/>.

**ElektroEko.** 2025a. „Międzynarodowy Dzień bez Elektrośmieci”. Międzynarodowy Dzień bez Elektrośmieci. <https://dzienbezelektrosmieci.pl/>.

**ElektroEko.** 2025b. „O ElektroEko”. ElektroEko. <https://www.elektroeko.pl/o-elektroeko/>.

**elektrosmieci.pl.** 2025. O NAS – Elektrośmieci. <https://elektrosmieci.pl/kim-jestesmy/>.

**Eucolight.** 2025. „Eucolight | About Us”. Eucolight. <https://www.eucolight.org/about-us/>.

**Europejski Trybunał Obrachunkowy.** 2021. „Działania UE dotyczące odpadów elektronicznych i wyzwania w tej dziedzinie”. [https://www.eca.europa.eu/lists/ecadocuments/rw21\\_04/rw\\_electronic\\_waste\\_pl.pdf](https://www.eca.europa.eu/lists/ecadocuments/rw21_04/rw_electronic_waste_pl.pdf).

**Eurostat.** 2022a. „Waste Electrical and Electronic Equipment (WEEE) by Waste Management Operations”. [https://doi.org/10.2908/ENV\\_WASELEE](https://doi.org/10.2908/ENV_WASELEE).

**Eurostat.** 2022b. „Waste Electrical and Electronic Equipment (WEEE) by Waste Management Operations – Open Scope, 6 Product Categories (from 2018 Onwards)”. [https://doi.org/10.2908/ENV\\_WASELEEOS](https://doi.org/10.2908/ENV_WASELEEOS).

**Eurostat.** 2024a. „Recycling rate of waste of electrical and electronic equipment (WEEE) separately collected”. [https://doi.org/10.2908/CEI\\_WM060](https://doi.org/10.2908/CEI_WM060).

**Eurostat.** 2024b. „Waste Statistics – Electrical and Electronic Equipment”. Waste Statistics – Electrical and Electronic Equipment. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste\\_statistics\\_-\\_electrical\\_and\\_electronic\\_equipment](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics_-_electrical_and_electronic_equipment).

**Eurostat.** 2025a. „Waste electrical and electronic equipment (WEEE) by waste management operations – open scope, 6 product categories (from 2018 onwards)”.

**Eurostat.** 2025b. „Waste electrical and electronic equipment (WEEE) by waste management operations – open scope, 6 product categories (from 2018 onwards)”. [https://ec.europa.eu/eurostat/databrowser/view/env\\_waseleeeos\\_custom\\_17327875/default/table](https://ec.europa.eu/eurostat/databrowser/view/env_waseleeeos_custom_17327875/default/table).

**Executive Magazine.** 2025a. „EC\_Magazine\_2-2025\_wywiady\_ElektroEko\_s\_x-x-BL”. Executive Club.

**Executive Magazine.** 2025b. „Organizacje odzysku jako podmioty zaufania publicznego Executive Club”. Executive Magazine (Warszawa).

**Executive Magazine.** 2025c. „Diamenty Zrównoważonej Gospodarki 2025 – wręczenie! Poznaj wyniki”. Executive Magazine – magazyn i portal biznesowy dla przedsiębiorców. <https://executivemagazine.pl/polecane/diamenty-zrownowazonej-gospodarki-2025-wreczenie-poznaj-wyniki/>.

**Gazzetta Ufficiale.** 2014. „DECRETO LEGISLATIVO, 14 marzo 2014, n. 49”. <https://www.governo.it/sites/governo.it/files/75158-9343.pdf>.

**Gfk Polonia.** 2019. „Zużyty Sprzęt Elektryczny i Elektroniczny. Wiedza i postawy w Polsce”.

**Gfk Polonia.** 2023. „Zużyty Sprzęt Elektryczny i Elektroniczny. Wiedza i postawy w Polsce”.

**Ghisellini, P., I. Quinto, R. Passaro, S. Ulgiati.** 2023. „Circular Economy Management of Waste Electrical and Electronic Equipment (WEEE) in Italian Urban Systems: Comparison and Perspectives”. „Sustainability” 15 (11): 9054. <https://doi.org/10.3390/su15119054>.

**GIOŚ.** 2024. „Światowy Dzień Bez Elektrośmieci – dbajmy o naszą planetę”. Główny Inspektorat Ochrony Środowiska. <https://www.gov.pl/web/gios/swiatowy-dzien-bez-elektrosmieci--dbajmy-o-nasza-planete>.

**Heikinheimo, A.** 2024. NATIONAL EXTENDED PRODUCER RESPONSIBILITY STRATEGIES FOR SUSTAINABLE WEEE MANAGEMENT. <https://trepo.tuni.fi/bitstream/10024/159788/2/HeikinheimoAnni.pdf>.

**IBnGR.** 2010. „Funkcjonowanie i nieprawidłowości w systemie zarządzania zużytym sprzętem elektrycznym i elektronicznym (ZSEE) w Polsce”. [https://doc.rmf.pl/rmf\\_fm/store/IBnGR\\_raport\\_ZSEE.pdf](https://doc.rmf.pl/rmf_fm/store/IBnGR_raport_ZSEE.pdf).

**Ilgemann, P., T. Fishman, R. Oudshoorn, A. Tukker.** 2025. „Improving WEEE Monitoring: Insights from The Netherlands”. „Resources, Conservation and Recycling” 222: 108486. <https://doi.org/10.1016/j.resconrec.2025.108486>.

**InfoProdukt.** 2025a. „ElektroEko laureatem prestiżowego rankingu «Diamenty Forbesa 2025»”. <https://infoprodukt.pl/article/59355?category=1797>.

**InfoProdukt.** 2025b. „Poważne wyzwania dla branży ZSEE”. Portal infoprodukt.pl. <https://infoprodukt.pl/article/powazne-wyzwania-dla-branzy-zsee?category=-1&id=59381>.

**InfoProdukt.** 2025c. „Poważne wyzwania dla branży ZSEE”. Portal infoprodukt.pl. <https://infoprodukt.pl/article/powazne-wyzwania-dla-branzy-zsee?category=-1&id=59381>.

**InfoProdukt.** 2025d. „ELEKTROEKO Po raz siódmy partnerem Kongresu AGD”. Portal infoprodukt.pl. <https://infoprodukt.pl/article/-777?category=-2>.

**InfoProdukt.** 2025e. „ELEKTROEKO Po raz siódmy partnerem Kongresu AGD”. Portal infoprodukt.pl.

**Jefatura del Estado.** 2022. „Ley 7/2022, de 8 de abril, de residuos y suelos contaminados para una economía circular”. <https://www.boe.es/eli/es/l/2022/04/08/7>.

**Klima- og miljødepartementet.** 2025. „Forskrift om gjenvinning og behandling av avfall (avfallsforskriften) – Kapittel 1. Kasserte elektriske og elektroniske produkter – Lovdata”. Lovdata.no. <https://lovdata.no/dokument/SF/forskrift/2004-06-01-930/kap1#kap1>.

**Komisja Europejska.** 2020. „Circular Economy Action Plan”. [https://environment.ec.europa.eu/strategy/circular-economy-action-plan\\_en](https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en).

**Komisja Europejska.** 2024. „July Infringement Package: Key Decisions”. [https://ec.europa.eu/commission/presscorner/detail/en/inf\\_24\\_3228](https://ec.europa.eu/commission/presscorner/detail/en/inf_24_3228).



**Komisja Europejska.** 2025a. „Circular Economy Action Plan – European Commission”. [https://environment.ec.europa.eu/strategy/circular-economy-action-plan\\_en](https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en).

**Komisja Europejska.** 2025b. „Key Actions Launched to Advance the Circular Economy”. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_25\\_1710](https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1710).

**Komisja Europejska.** 2025c. „Commission Staff Working Document 2025 Environmental Implementation Review Country Report – Poland. Accompanying the Document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 2025 Environmental Implementation Review for Prosperity and Security”. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52025SC0320&qid=1752154006613>.

**Komisja Europejska.** 2025d. „EU Budget 2028-2034”. [https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034\\_en](https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034_en).

**Ledvance.** 2025. „O LEDVANCE”. <https://www.ledvance.pl/professional/company/about-ledvance>.

**Légifrance.** 2014. „Arrêté du 24 décembre 2014 portant agrément de l'organisme OCAD3E en tant qu'organisme coordinateur pour la filière des déchets d'équipements électriques et électroniques en application des articles R. 543-182 et R. 543-183 du code de l'environnement – Légifrance”. <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000030001581>.

**Légifrance.** 2021. „Arrêté du 27 octobre 2021 portant cahiers des charges des éco-organismes, des systèmes individuels et des organismes coordonnateurs de la filière à responsabilité élargie du producteur des équipements électriques et électroniques – Légifrance”. <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000044273082/>.

**Mallick, P.K., K. Salling, D.C.A. Pigosso, T.C. McAloone.** 2024. „Designing and Operationalising Extended Producer Responsibility under the EU Green Deal”, „Environmental Challenges” 16. <https://doi.org/10.1016/j.envc.2024.100977>.

**MillwardBrown SMG/KRC.** 2006. „Badanie rynku ZSEE oraz zwyczajów i nastawienia społeczeństwa do utylizacji ZSEE”.

**Ministerstwo Cyfryzacji.** 2024. „Strategia Cyfryzacji Polski do 2035 roku – Ministerstwo Cyfryzacji – Portal Gov.pl”. <https://www.gov.pl/web/cyfryzacja/strategia-cyfryzacji-polski-do-2035-roku>.

**Ministerstwo Finansów.** 2025. „Przeglądarka dokumentów finansowych KRS”. [prz.ms.gov.pl. https://ekrs.ms.gov.pl/rdf/pd/search\\_df](https://prz.ms.gov.pl/https://ekrs.ms.gov.pl/rdf/pd/search_df).

**Ministry of Infrastructure and Water Management.** 2025. „Uitgebreide producentenverantwoordelijkheid (UPV)”. <https://www.afvalcirculair.nl/uitgebreide-producentenverantwoordelijkheid-upv/>.

**MKiŚ.** 2025. BDO. <https://bdo.mos.gov.pl/>.

**MKiŚ i ElektroEko.** 2024. „Sprzęt – dane z MKiŚ za rok 2023 – opracowanie EE (2018-2023)”.

**MMbE.** 2025. „Moje Miasto Bez Elektrośmieci”. <https://moje-miasto-bez-elektrosmieci.pl/>.

**MOL GROUP.** 2023a. „MOL Will Take over Waste Management Activities on 1 July – Investor News”. <https://molgroup.info/en/investor-relations/investor-news/mol-will-take-over-waste-management-activities-on-1-july>.

**MOL GROUP.** 2023b. „MOL Wins Concession for Waste Management Services – Investor News – Investor News”. <https://molgroup.info/en/investor-relations/investor-news/mol-wins-concession-for-waste-management-services>.

**Nerdjes, M., A. Djamel, B. Roukia.** 2024. „Towards Sustainable Practices: a Comparative Study of Japanese, Italian, and Algerian Household Waste Management Models”. „International Journal of Innovative Technologies in Social Science” 4(44). [https://doi.org/10.31435/ijitss.4\(44\).2024.3100](https://doi.org/10.31435/ijitss.4(44).2024.3100).

**NHKV.** 2024. „NHKV – Bemutatókötés”. <https://nhkv.hu/tevekenyseink/>.

**Supreme Audit Office.** 2017. „System Zarządzania Zużytym Sprzętem Elektrycznym I Elektronicznym”. [https://www.nik.gov.pl/kontrol/wyniki-kontroli-nik/pobierz,lki~p\\_16\\_072\\_201611041014071478254447~01,typ,kk.pdf](https://www.nik.gov.pl/kontrol/wyniki-kontroli-nik/pobierz,lki~p_16_072_201611041014071478254447~01,typ,kk.pdf).

**Supreme Audit Office.** 2022. „Funkcjonowanie systemu gospodarki odpadami komunalnymi i użytkowymi oraz transgraniczne przemieszczanie odpadów”. KSI.430.005.2021. <https://www.nik.gov.pl/kontrol/P/20/045/>.

**Supreme Audit Office.** 2025. „Porażka w gospodarowaniu odpadami – Polska może nie wywiązać się z unijnych zobowiązań – Najwyższa Izba Kontroli”. <https://www.nik.gov.pl/aktualnosci/gospodarowanie-odpadami.html>.

**Noizz.** 2021. „Nie wyrzucaj elektrośmieci do śmietnika. Nowy, ekologiczny mural w centrum Warszawy!” Noizz.pl. <https://noizz.pl/nie-wyrzucaj-elektrosmieci-do-smietnika-nowy-ekologiczny-mural-w-centrum-warszawy/57n3egg>.

**Odpady i Środowisko.** 2014. „Odpady i Środowisko” 5. Dziennikarska Agencja Wydawnicza MAXPRESS. [https://www.e-srodowisko.pl/images/Odpady\\_i\\_%C5%9Arodowisko\\_5-2014.pdf](https://www.e-srodowisko.pl/images/Odpady_i_%C5%9Arodowisko_5-2014.pdf).

**Odpady i Środowisko.** 2015. „Odpady i Środowisko” 5. Dziennikarska Agencja Wydawnicza MAXPRESS. [https://www.e-srodowisko.pl/images/Odpady\\_i\\_%C5%9Arodowisko\\_2016.pdf](https://www.e-srodowisko.pl/images/Odpady_i_%C5%9Arodowisko_2016.pdf).

**Odpady i Środowisko.** 2016. „Odpady i Środowisko” 10. Dziennikarska Agencja Wydawnicza MAXPRESS. [https://www.e-srodowisko.pl/images/%C5%9Arodowisko\\_10-2016.pdf](https://www.e-srodowisko.pl/images/%C5%9Arodowisko_10-2016.pdf).

**Odpady i Środowisko.** 2025. „Odpady i Środowisko” 3: 13–20. Dziennikarska Agencja Wydawnicza MAXPRESS. <https://doi.org/906247>.

**OECD.** 2023. „Towards a National Circular Economy Strategy for Hungary”. [https://www.oecd.org/en/publications/towards-a-national-circular-economy-strategy-for-hungary\\_1178c379-en.html](https://www.oecd.org/en/publications/towards-a-national-circular-economy-strategy-for-hungary_1178c379-en.html).

**OFIRAE.** 2005. „OFIRAE – Oficina de coordinación logística para la recogida de los RAEE.” <https://www.ofirae.es/castilla-la-mancha/index.html>.

**Okopol, K.S., S. Schilling et al.** 2007. „The Producer Responsibility Principle of the WEEE Directive”.

**OLAF.** 2022. „OLAF Finds Irregularities in EU-Funded Waste Management Projects in Hungary – European Commission”. Press Release No 14/2022. [https://anti-fraud.ec.europa.eu/media-corner/news/olaf-finds-irregularities-eu-funded-waste-management-projects-hungary-2022-11-23\\_en](https://anti-fraud.ec.europa.eu/media-corner/news/olaf-finds-irregularities-eu-funded-waste-management-projects-hungary-2022-11-23_en).

**Polish Press Agency.** 2015. „Sejm uchwalił ustawę o zużytym sprzęcie elektronicznym”. Teraz-Środowisko. <https://www.teraz-srodowisko.pl/aktualnosci/Sejm-uchwalil-ustawe-zuzyty-sprzecie-elektronicznym-1102.html>.

**Parlament Europejski.** 2003. „Dyrektywa 2002/96/WE Parlamentu Europejskiego i Rady z dnia 27 stycznia 2003 r. w sprawie zużytego sprzętu elektrotechnicznego i elektronicznego (WEEE)”. <http://data.europa.eu/eli/dir/2002/96/oj/pol>.

**Parlament Europejski.** 2020. „Zużyty sprzęt elektryczny i elektroniczny w UE: fakty i liczby (infografika)”. <https://www.europarl.europa.eu/topics/pl/article/20201208STO93325/zuzyty-sprzet-elektryczny-i-elektroniczny-w-ue-fakty-i-liczby-infografika>.

**Parlament Europejski.** 2021. „New Circular Economy Action Plan”. [https://www.europarl.europa.eu/doceo/document/TA-9-2021-0040\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-9-2021-0040_EN.html).

**Parlament Europejski i Rada (UE).** 2003. „Dyrektywa 2002/96/WE Parlamentu Europejskiego i Rady z dnia 27 stycznia 2003 r. w sprawie zużytego sprzętu elektrotechnicznego i elektronicznego (WEEE)”. <http://data.europa.eu/eli/dir/2002/96/oj/pol>.

**Parlament Europejski i Rada (UE).** 2012. „Dyrektywa Parlamentu Europejskiego i Rady 2012/19/UE z dnia 4 lipca 2012 r. w sprawie zużytego sprzętu elektrycznego i elektronicznego (WEEE) (przekształcenie) Tekst mający znaczenie dla EOG”. <http://data.europa.eu/eli/dir/2012/19/oj/pol>.

**Parlament Europejski i Rada (UE).** 2018. „Directive 2012/19/UE of the European Parliament and of the Council of 4 July 2012 on Waste Electricals.Pdf”. <https://eur-lex.europa.eu/eli/dir/2012/19/2018-07-04/eng>.

**Parlament Europejski i Rada (UE).** 2024. „Dyrektywa Parlamentu Europejskiego i Rady (UE) 2024/884 z dnia 13 marca 2024 r. w sprawie zmiany dyrektywy 2012/19/UE w sprawie zużytego sprzętu elektrycznego i elektronicznego (WEEE) (Tekst mający znaczenie dla EOG)”. <http://data.europa.eu/eli/dir/2024/884/oj/pol>.

**Parlament Europejski i Rada (UE).** 2025. Rozporządzenie Parlamentu Europejskiego i Rady (UE) 2025/40 z dnia 19 grudnia 2024 r. w sprawie opakowań i odpadów opakowaniowych, zmiany rozporządzenia (UE) 2019/1020 i dyrektywy (UE) 2019/904 oraz uchylenia dyrektywy 94/62/WE (Tekst mający znaczenie dla EOG)”. <http://data.europa.eu/eli/reg/2025/40/oj>.

**PARP.** 2025. „Nowe technologie w recyklingu elektrośmieci”. <https://www.parp.gov.pl/component/content/article/88514:nowe-technologie-w-recyklingu-elektrosmieci>.

**Pavol Bors.** 2024. Challenges for Organising and Collective Bargaining in Care, Administration and Waste Collection Sectors in Central and Eastern European Countries.

**Plastics Recyclers Europe.** 2024. „Plastics Recycling Industry Figures 2023”. [https://www.plasticsrecyclers.eu/wp-content/uploads/2024/11/Plastics-Recycling-Industry-Figures\\_2023.pdf](https://www.plasticsrecyclers.eu/wp-content/uploads/2024/11/Plastics-Recycling-Industry-Figures_2023.pdf).

**Przegląd Komunalny.** 2021. „Węgry nie są dobrym przykładem dla wdrożenia ROP”. PortalKomunalny.pl, <https://portalkomunalny.pl/plus/arttykul/wegry-nie-sa-dobrym-przykladem-dla-wdrozenia-rop/>.

**Przydatek, G., W. Kanownik.** 2024. „Assessment of Direction Changes in Waste Electrical and Electronic Equipment Management in Poland”. „Environmental Science and Pollution Research” 31(35). <https://doi.org/10.1007/s11356-024-34227-4>.

**Recupel.** 2024. „Recupel Annual Report”. Annual Report 2024. <https://annualreport.recupel.be/>.

**Rekopol.pl.** 2025a. „Przedsiębiorcom nie podoba się pomysł na nowy ROP”. <https://rekopol.pl/newsletter/przedsiębiorcom-nie-podoba-sie-pomysl-na-nowy-rop/>.

**Rekopol.pl.** 2025b. „Niebezpieczne założenia nowego systemu Rozszerzonej Odpowiedzialności Producenta – nacjonalizacja i”. <https://rekopol.pl/newsletter/niebezpieczne-zalozenia-nowego-systemu-rop/>.

**Rogowska, J., K. Piątkowska, Z. Głowacz.** 2024. „Societal Involvement in Household Waste Sorting Behavior in the Context of the Circular Economy: A Case Study of Poland”. „Sustainability” 16(5). <https://doi.org/10.3390/su16051841>.

**Rzeczpospolita.** 2012. „Szkole nie wolno samej zbierać elektroodpadów”. <https://www.rp.pl/samorzad/art13373551-szkole-nie-wolno-samej-zbierac-elektroodpadow>.

**Rzeczpospolita.** 2013. „Przeplacamy za recykling starych pralek i lodówek”. <https://www.rp.pl/srodowisko/art5615151-przeplacamy-za-recykling-starych-pralek-i-lodowek>.

**Signify.** 2025. „Signify Company Website”. <https://www.signify.com/pl-pl>.

**Stichting Open.** 2025. „2025.05.28-Stichting-OPEN-Jaarverslag-2024\_online”. [https://www.stichting-open.org/wp-content/uploads/2025/05/2025.05.28-Stichting-OPEN-Jaarverslag-2024\\_online.pdf](https://www.stichting-open.org/wp-content/uploads/2025/05/2025.05.28-Stichting-OPEN-Jaarverslag-2024_online.pdf).

**Stiftung EAR.** 2004. „Stiftung Ear – Your Authority for Implementing ElektroG & BattG | Stiftung Elektro-Altgeräte Register”. <https://www.stiftung-ear.de/en/>.

**TCO Certified.** 2021. „Education Is Key to Help Consumers Be Circular”. TCO Certified. <https://tcocertified.com/circular-electronics-day-case/education-is-key-to-help-consumers-be-circular/>.

**Teraz Środowisko.** 2023. „W 2024 r. branżę czeka gorąca dyskusja nad kształtem przyszłego systemu ZSEE”. <https://www.teraz-srodowisko.pl/aktualnosci/Jaki-bedzie-system-ZSEE-w-2024-Wojciech-Konecki-APPLIA-14421.html>.

**Umweltbundesamt.** 2025. „Umweltbundesamt”. <https://www.umweltbundesamt.de>.

**VYSOČINA WIND as protiivko Česká republika – Ministerstvo životního prostředí, Správa C-181/20 (Trybunał Sprawiedliwości 25 stycznia 2022).** <https://eur-lex.europa.eu/legal-content/PL/ALL/?uri=CELEX%3A62020CJ0181>.

**Waterstaat, Ministerie van Infrastructuur en.** 2020. „Regeling van de Staatssecretaris van Infrastructuur en Waterstaat, van 29 juni 2020, nr. IENW/BSK-2020/117591, met betrekking tot een algemeen verbindend verklaring van een overeenkomst over een afvalbeheersbijdrage, tot intrekking van de Regeling verzoek afvalbeheersbijdragen en tot wijziging van enkele regelingen ter implementatie van Richtlijn (EU) 2018/851 van het Europees Parlement en de Raad van 30 mei 2018 tot wijziging van Richtlijn 2008/98/EG betreffende afvalstoffen (PbEU 2018, L 150) (Regeling verzoek algemeen verbindend verklaring overeenkomst afvalbeheersbijdrage)”. Officiële publicatie. artikelen 1.1, vijfde, zevende, achtste en elfde lid, 10.29, eerste lid, 15.36, tweede lid, en 21.6, zesde lid, van de Wet milieubeheer; artikelen 3, derde lid, en 5, derde lid, van het Besluit melden bedrijfsafvalstoffen en gevaarlijke afvalstoffen; en artikel 2.12, zesde lid, van het Activiteitenbesluit milieubeheer, Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, lipca 7. <https://zoek.officielebekendmakingen.nl/stcrt-2020-34945.html>.

**WEEE Forum.** 2019a. „WEEE Forum”. WEEE Forum, lutego 19. <https://weee-forum.org/>.

**WEEE Forum.** 2019b. What We Do | WEEE Forum. <https://weee-forum.org/what-we-do/>.

**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](https://weee-forum.org/wp-content/uploads/2020/11/EPR-and-the-role-of-all-actors_final.pdf).

**WEEE Forum.** 2025a. „Who We Are | WEEE Forum”. <https://weee-forum.org/who-we-are/>.

**WEEE Forum.** 2025b. „20 Years ON”. [https://weee-forum.org/wp-content/uploads/2022/12/20-Years-On\\_Final.pdf](https://weee-forum.org/wp-content/uploads/2022/12/20-Years-On_Final.pdf).

**WEEE Forum.** 2025c. „Key Figures WEEE Forum 2025”. Zestawienie danych.

**WEEE Forum, APPLiA, digitaleurope, i Lighting Europe.** 2025. „Joint Industry Priorities for the Circular Economy Act | WEEE Forum”. [https://weee-forum.org/ws\\_news/joint-industry-priorities-for-the-circular-economy-act/](https://weee-forum.org/ws_news/joint-industry-priorities-for-the-circular-economy-act/).

**WEEELABEX i WEEE Forum.** 2019. WEEELABEX – WEEE Label of Excellence | WEEE Forum. <https://weee-forum.org/projects-campaigns/weee-labex/>.

**Związek Cyfrowa Polska.** 2025. „Związek Cyfrowa Polska”. <https://cyfrowapolska.org/>.

