Training on environmentally friendly scrapping of Waste Electrical and Electronic Equipment (WEEE)

Lisbon, 1st July 2024

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WEEE Treatment Facilities

03

ELECTRÃO NETWORK

WASTE PRODUCER/ CONSUMER

COLLECTION POINTS

- Collection centers
- “Pontos Electrão”
- Retailers
- Fire Stations
- Schools
- SGRUS (Urban Waste Management Systems)

RECEPTION CENTERS

WASTE TREATMENT OPERATOR (WTO)

- Recycling
- Energy Recovery
- Disposal

WEEE LEGAL CATEGORIES

1. Temperature exchange equipment

Large cooling appliances, refrigerators, freezers, air conditioner appliances, other Fanning, exhaust ventilation and conditioning equipment.

2. Screens, monitors and equipment containing screens having a surface greater than 100 cm2

Screens, television sets, LCD, laptops, notebooks, digital photo frames, others.

3. Lamps

Straight fluorescent lamps, compact fluorescent lamps, high intensity discharge lamps, low pressure sodium lamps, LED.

4. Large equipment

Large household appliances (washing machines, clothes dryers, dish washing machines, cookers, electric stoves, …), luminaires, musical equipment, large computer mainframes, large printing machines, copying equipment, large coin slot machines, photovoltaic panels, others.

5. Small equipment

Small household appliances (vacuum cleaners, carpet sweepers, microwaves, irons, toasters, …), electric shavers, scales, radio sets, video cameras, musical instruments, sports equipment, luminaires, smoke detectors, others

6. Small IT and telecommunication equipment (no external dimension more than 50 cm)

Mobile phones, GPS, pocket calculators, routers, personal computers, printers, telephones, tonners, others.

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WEEE LEGAL CATEGORIES

1

Legislation defines **6 categories** into which it classifies electrical and electronic equipment.

2

The categories are mainly defined to classify the **products** by their function, applications and dimensions.

3

The categories already take into consideration the **waste characteristics**, for example, need for treatment of hazardous substances, mass composition, available technologies for treatment.

4

National legislation establishes recycling/valorization **targets** for each legal category.

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CAT 1 (TEMPERATURE EXCHANGE EQUIP.)

EWL Classification

16 02 11* and 20 01 23*:

- Refrigerators, freezers
- Equipment which automatically delivers cold products, other cooling and freezing equipment
- All type of air conditioning equipment

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CAT 2 (SCREENS AND MONITORS)

EWL Classification

16 02 13* and 20 01 35*:

- CRT screens and monitors
- Flat screens TV and monitors
- Other screens with a surface area greater than 100 cm2

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CAT 3 (LAMPS)

EWL Classification

20 01 21*:

- Straight fluorescente lamps
- Compact fluorescente lamps
- LED lamps
- Other lamps

http://www.kirklandwa.gov
https://www.teknistore.com

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CAT 4, 5 and 6 (LARGE, SMALL AND IT)

EWL Classification

16 02 14 and 20 01 36:

- Washing machines, cookers, electric stoves
- Photovoltaic panels
- Vacuum cleaners, toasters, microwaves, irons, coffee machines, electric knifes, hair dryers, tools, toys, musical instruments
- IT equipment, personal computers, printers, copying equipment, calculators, routers, phones, mobile phones

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WEEE OPERATIONAL SUBCATEGORIES

Operational management (collection, treatment and recycling/recovery) is not carried out in legal categories but **in operational categories**:

- Operational subcategories divide WEEE from each legal category
- Division according to waste characteristics, such as need for treatment of hazardous substances, mass composition, technologies available for treatment and recovery
- WEEE treatment results (eg depollution, recycling and recovery rates) are calculated in operational subcategories and then converted into results by legal category for comparison with targets

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WEEE OPERATIONAL SUBCATEGORIES

Cat 1: Temperature exchange equip

1A: Refrigerators and freezers
1B: Air conditioning
1C: Other equipment (without VFC/VHC)

Cat 2: Screens and monitors

2A: CRT screens and monitors
2B: Flat screens TV and monitors
2C: Laptops and notebooks

Cat 3: Lamps

3A: Straight fluorescent lamps
3B: Compact lamps
3C: Gas discharge lamps
3D: LED

Cat 4: Large equipment

4A: Large equipment
4B: Photovoltaic panels
4C: Large IT

Cat 5: Small equipment

5: Small equipment

Cat 6: Small IT equipment

6A: IT and telecommunication equipment
6B: Tonners and printer cartridges

WEEE TREATMENT OPERATORS (WTO)

TREATMENT PROCESSES

- Manual separation
- Decontamination
- Manual dismantling
- Crushing/Shredding
- Magnetic separation
- Separation by optical means
- Physicochemical separation
- Dense media separation

- **GLASS**
- **PLASTIC**
- **PAPER**
- **METAL**
- **WOOD**

RECYCLING

- **OTHER MATERIALS**
- **HAZARDOUS SUBSTANCES**

RECOVERY ELIMINATION

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WEEE COMPONENTS AND FRACTIONS

WEEE fractions are classified into 2 groups:

- **Critical fractions:** fractions used to evaluate the efficiency of depollution, which include the mandatory removal fractions identified in UNILEX, and the fractions selected for the phased payment of the treatment financial compensation (e.g. VFC & VHC, PUR foam, tube glass, capacitors, batteries).

- **Non-critical fractions:** fractions without legal requirement for selective treatment but which are separated and monitored with the aim of achieving WEEE recycling and recovery target rates (e.g. metal, plastic)

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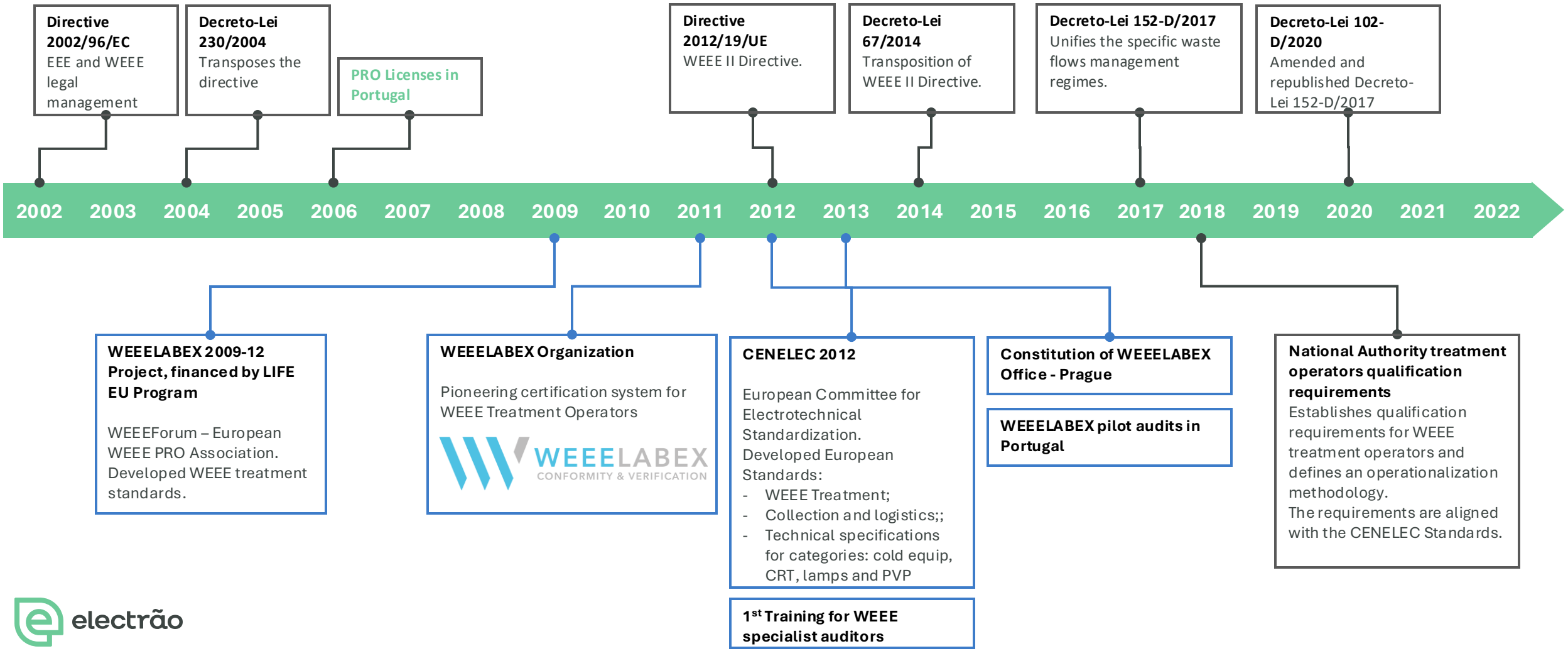
TREATMENT REQUIREMENTS AND STANDARDS

Historic evolution



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CENELEC EUROPEAN STANDARDS

CENELEC
EUROPEAN COMMITTEE
FOR ELECTROTECHNICAL STANDARDIZATION

- Set of CENELEC Standards and Technical Specifications are already published and can be purchased at IPQ (Portugal).
- **Standards** establish general requirements.
- **Technical Specifications** establish the technical requirements.
- The standardization process was quite complex, of high technical density and only ended in the second quarter of 2020.
- CENELEC Standards currently constitute the international reference in terms of WEEE regulations.

50614 Preparing for re-use

50574-1. Cooling and freezing requirements (50625-2-3)

50574-2. TS on C&F (to become: 50625-3-4)

50625-1. General treatment requirements

50625-2-1. Lamps requirements

50625-2-2. Displays requirements

50625-2-3. Cooling and freezing requirements

50625-2-4. Photovoltaic panels requirements

***50625-3-1.* General Technical Specification**

***50625-3-2.* Lamps Technical Specification**

***50625-3-3.*Displays Technical Specification**

***50625-3-4.*C&F Technical Specification**

***50625-3-5.*PV panels Technical Specification**

50625-4 Collection and Logistics requirements (TS)

50625-5 End-processing fractions (TS)

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1. ADMINISTRATIVE AND ORGANIZATIONAL REQUIREMENTS

1.1. Management principles

- Maintain a record of compliance with legal obligations, regulations and qualification requirements.
  - **Updated list od relevant legislation and associated requirements**;
- Establish and maintain a procedure to identify legal and qualification requirements applicable to environmental, health and safety aspects, services and processes.
  - ✓ **Frequency with which the compliance of the facilities must be checked;**
  - ✓ Need to verify legislative or regulatory changes as well as elements that require renewal (e.g. treatment permits, transport permits, capture and/or discharge authorizations, emission permits);
  - ✓ **Responsible person.**

1. ADMINISTRATIVE AND ORGANIZATIONAL REQUIREMENTS

1.2. Technical and infrastructure requirements

- **Suitable infrastructure** (in terms of size, installed technologies and operation characteristics) for the activities carried out in the facilities.
    - Storage and treatment areas with impermeable surfaces and weatherproof covers, spill collection and/or decanters and degreasers.
    - Weatherproof cover for gas discharge lamps, equipment with a cathode ray tube (CRT) and equipment with flat screens.
- The existence of an updated **risk assessment**, prepared by qualified entities and which includes all activities carried out, including the hazards identification.
- Treatment facilities must take into account safe access and exit, present security conditions that prevent access by unauthorizes personnel, avoiding damage and/or theft.

Moving and packaging


Waterproofing and covering

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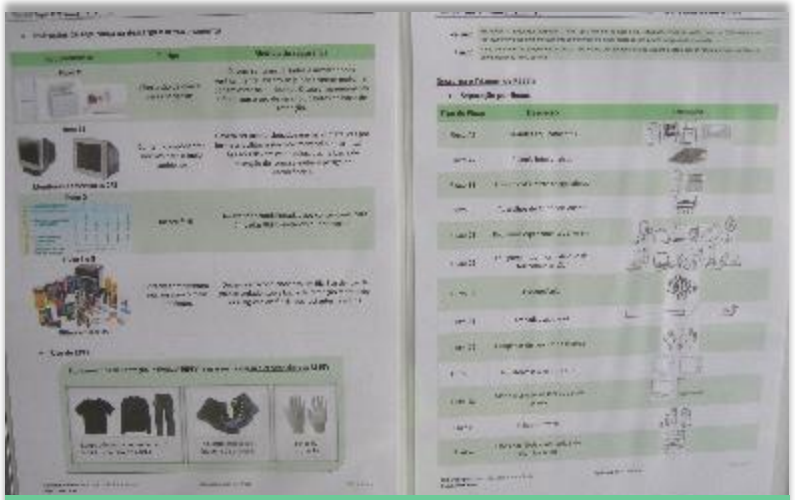
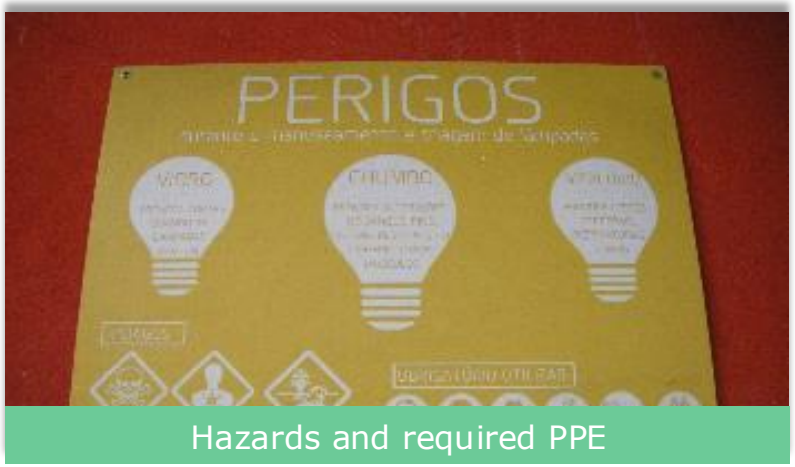
1. ADMINISTRATIVE AND ORGANIZATIONAL REQUIREMENTS

1.3. Training

- Employees must receive instructions and training for their assigned tasks.
- Training should include emergency response plans and health, safety and hygiene at work measures, particularly for the correct IPE (personal protective equipment) use.
- Information and training materials must be available at all times at the workplace or in a place that is easily accessible to all employees.



Operating instructions



Hazards and required PPE

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1. ADMINISTRATIVE AND ORGANIZATIONAL REQUIREMENTS

1.4. Waste processing chain monitoring (downstream monitoring)

- For each WEEE batch received and accepted at its facilities the treatment operator must record the weight and origin, by category and EWL.
- The treatment operator **documents the entire downstream treatment chain** until the resulting fractions reach the end of waste status or until the WEEE fractions are prepared for reuse, recycled, recovered or disposed.
- The treatment operator keeps records of the fractions that result from the treatment process (dismantling).
- The treatment operator has information on who receives the waste downstream, namely address, type of operation, Siliamb ID and guarantee that this operator is duly licensed to receive this material.

Control of entrances to facilities

2. TECHNICAL REQUIREMENTS

2.1. General technical requirements

- WEEE are handled and stored with due care in order to avoid damage and/or leaks that could lead to the release of dangerous substances into the air, water or soil;
- During handling and storage, special attention must be paid to WEEE classified as hazardous;
- The treatment operator destroys confidential and personal data stored in the permanent memory of WEEE received in the facilities.

Destruction of stored data

2. TECHNICAL REQUIREMENTS

2.2. WEEE reception at treatment facilities

- Existence of an internal record relating to the waste reception;
- Separate registration of WEEE and non-WEEE as well as their respective separation in the facilities;
- Individualized WEEE registration by category, even when they are received under the same EWL code;
- Evidence of WEEE weighing by category (e.g. weighing slip or manual recording).

WEEE weighing by category

Sorting and storage by category

2. TECHNICAL REQUIREMENTS

2.3. WEEE handling

- WEEE handling is carried out with appropriate tools in order to avoid damage that compromises the preparation for reuse or emission of dangerous substances;
- Uncontrolled unloading of containers containing equipment with CRT or flat screen, temperature regulation equipment, lamps or other equipment whose proper treatment could be compromised is not permitted;
- WEEE must not be handled in a way that hinders or prevents subsequent preparation for reuse, decontamination or recovery.

Uncontrolled discharge

Damage that compromises treatment

2. TECHNICAL REQUIREMENTS

2.4. WEEE storage prior to treatment

- The maximum amount of WEEE stored must not exceed the amount of WEEE that can be treated at the facility in 6 months;
- Storage locations must have impermeable surfaces, weatherproof covers, relevant spill collection systems and where appropriate, decanters and purifiers-degreasers;
- Containers must be decontaminated before reuse, recycling or disposal whenever they are used to store equipment or fractions that may have led to the release and/or dispersion of pollutants.

Impermeable surfaces and coverings

Container decontamination

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2. TECHNICAL REQUIREMENTS

2.5. Decontamination

- The treatment operator must have procedures to identify which WEEE may contain substances, mixtures or components that must be removed, as well as the treatment process to be adopted;
- Treatment processes must result in the removal of substances, mixtures and components of mandatory removal;
- Decontamination must not damage or destroy components so that hazardous substances are released or pass to the fractions, unless subsequent treatment can remove them or render them harmless;
- When there is a possibility of releasing hazardous substances into the environment, the fraction containing them must be contained and/or sealed before treatment;

Mandatory removal components

Sealing components with PCB (polychlorinated biphenyls)

2. TECHNICAL REQUIREMENTS

2.5. Decontamination (cont)

- Fractions containing hazardous substances, mixtures or components must not be diluted or mixed with other fractions or materials with the aim of reducing their concentration;
- If it is uncertain whether the WEEE contains hazardous substances, mixtures or components, it should be treated as containing these substances, mixtures or components (precautionary principle).

Dilution of fractions (e.g. plastic with POP

Uncertainty regarding the PCBs (polychlorinated biphenyls) presence

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2. TECHNICAL REQUIREMENTS

2.6. Decontamination monitoring

- Existence of a treatment procedure that demonstrates, for the different categories, the steps for the adequate removal of the listed components;
- Carrying out treatment operations in the facilities;
- What monitoring methods are used and how frequently they are used.

Methods	Verification
Minimum value	Standardized technical tests that prove the separation capacity and documents thar prove effective shipping
Mass balance	Standardized technical tests, promoted by a specialist, under standard operating conditions.
Laboratory analysis	Standardized collection, by specialist, of representative samples and evidence from laboratory analysis reports.

2. TECHNICAL REQUIREMENTS

2.7. WEEE and uncontaminated fractions treatment

- WEEE and fractions containing hazardous substances or components must be treated separately from other waste;
- Sending uncontaminated WEEE to a downstream operator requires alerting the subsequent operator about the possible presence of hazardous material and the need to decontaminate the WEEE or its fraction.

WEEE separation

WEEE contaminated

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2. TECHNICAL REQUIREMENTS

2.8. Fraction storage

- Fractions containing hazardous substances must be stored in such a way that the hazardous material cannot contaminate the environment;
- Capacitors, batteries, printed circuit boards, toner cartridges, CRT, lamps, components containing mercury, asbestos, ceramic fibers, glass fibers and radioactive substances must be stored in covered weatherproof areas;
- The containers used for storing fractions containing hazardous substances must be cleaned and decontaminated prior to their reuse, recycling or disposal.

Hazardous fraction storage

Closed containers

2. TECHNICAL REQUIREMENTS

2.9. Recycling and recovery targets

- Operators must adopt the necessary measures to ensure that recovery targets are met;
- Operators must record all information to facilitate recycling and recovery targets calculations.

Treatment operator must guarantee:

Information regarding the treatment processes carried out by downstream operators and the respective efficiencies of recovery and disposal operations

Treatment processes mass balance for comparison with reference values

Supporting data

Standardized technical tests (“batch tests”)

Verification

Real data obtained in a test validated by a third party, under normal operating conditions.

2. TECHNICAL REQUIREMENTS

Treatment tests ("batch test")

Selection of representative samples and weighing of input material

- Technical audit with the aim of quantifying the WEEE fractions removal and separation efficiency and evaluating the specific depollution performance for the WEEE categories processed by the WTO;

WEEE processing and weighing of output fractions

- It consists of the controlled processing of a representative WEEE sample of the day-to-day life of the WTO;

Calculation of recycling, recovery and depollution rates

- Fractions removed during the test are weighed and characterized in order to calculate the recycling, recovery and depollution performance;

Laboratory analysis of output fractions (e.g. plastics, light fraction)

- Fractions with the potential to be contaminated with dangerous substances are subject to laboratory analysis to quantify the concentration.

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2. TECHNICAL REQUIREMENTS

2.10. Fractions recovery and disposal

- The fractions resulting from the WEEE treatment process may reach the end of waste status or may be sent for recycling, recovery or disposal;

- Hazardous waste intended for disposal must only be sent to facilities that can receive this type of waste and dispose of it.

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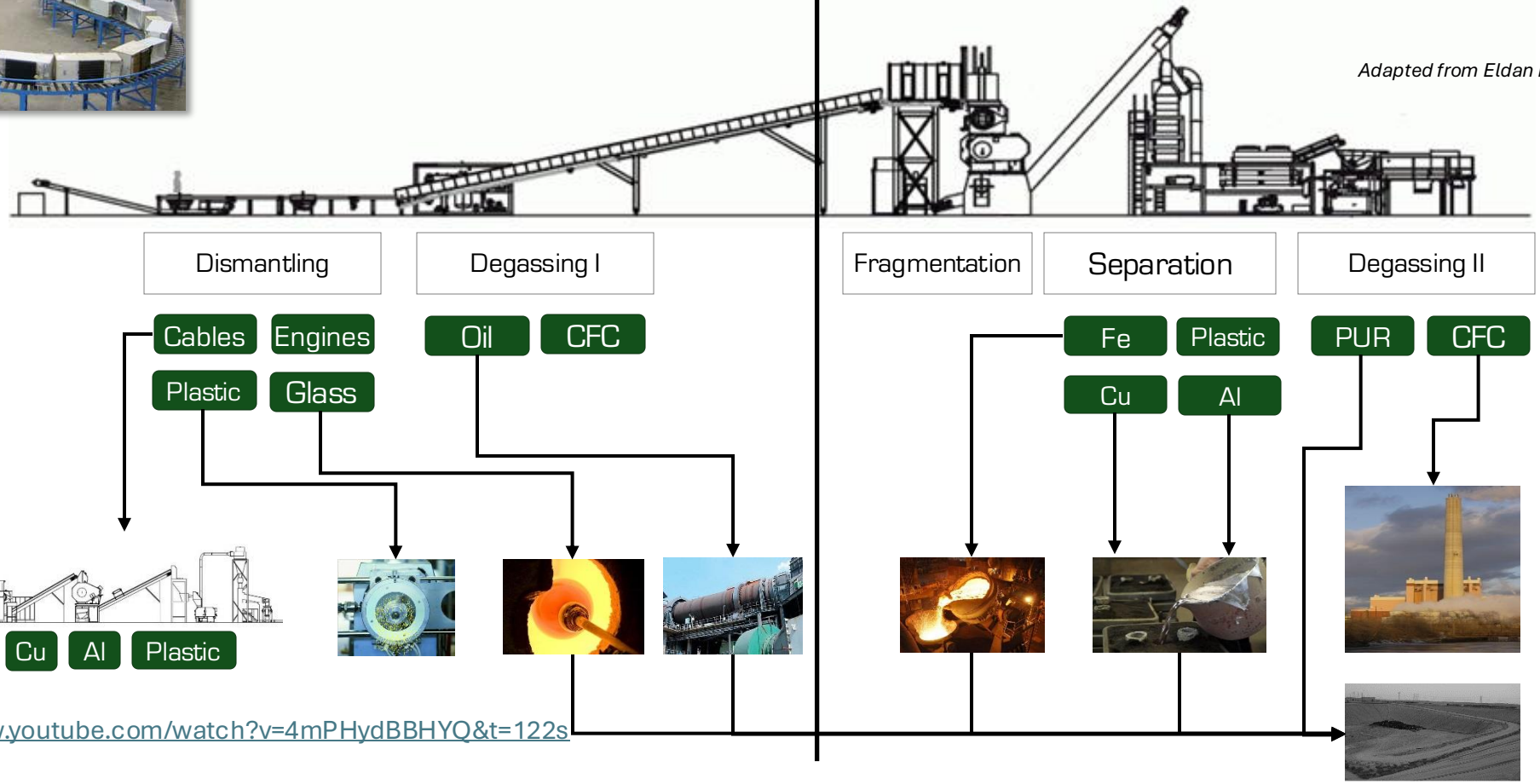
3. DOCUMENTATION

- Records of assessment of compliance with legal requirements;
- Treatment flowcharts;
- Decontamination monitoring records;
- Procedures for destroying confidential information in WEEE;
- WHS (emergency plan, risk assessment, accident record, etc.);
- Training records;
- Container cleaning and decontamination records;
- Downstream chain records that support calculation of recycling and recovery rates;
- Documentation kept for at least 3 years:
- Conformity verification report carried out by an independent entity duly certified to CENELEC standards.

WEEE TREATMENT

Category 1 (Temperature regulation equip.)

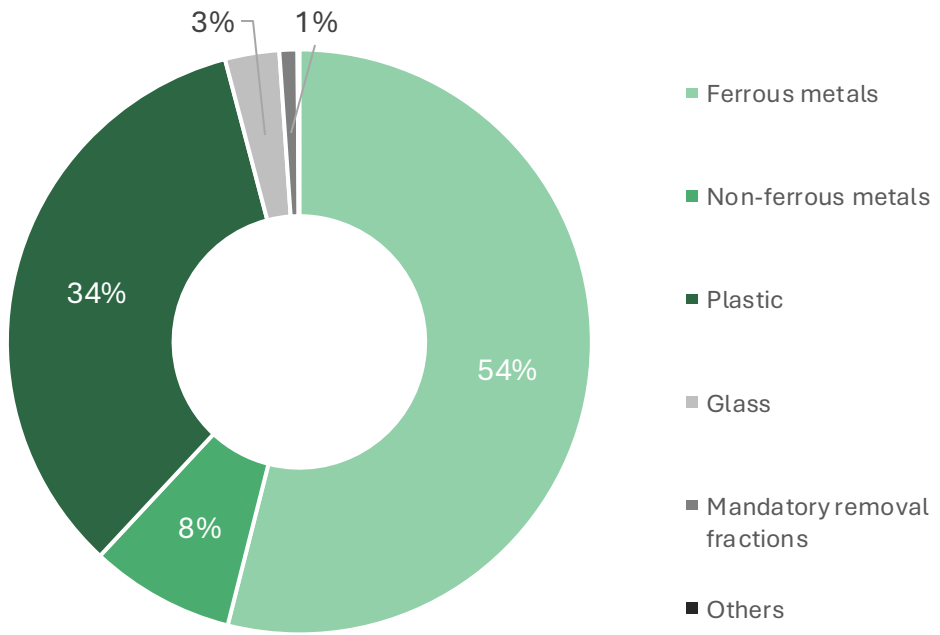


https://www.youtube.com/watch?v=4mPHydBBHYQ&t=122s

WEEE TREATMENT

Category 1

Material composition



Based on the amounts treated in 2023 (Electrão)

Main fractions with reference values defined by CENELEC standards:

Phase I

Capacitors removal > 0,08 kg/t [1]

VFC/VHC in the oil < 0,2% in weight [2]

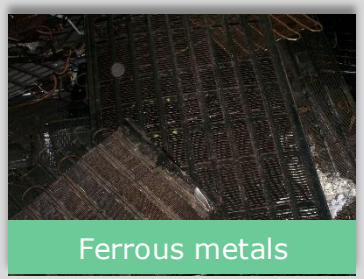
Oil in the compressor < 15 gr [2]

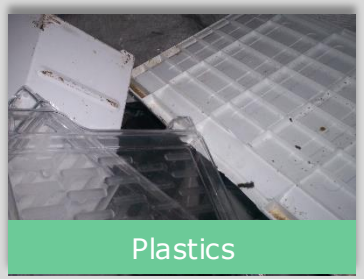
Phase II

VFC/VHC in PUR foam < 0,2 % in weight [2]

PUR foam in metal fraction < 0,3% in weight [2]

PUR foam in plastic fraction < 0,5% in weight [2]


Ferrous metals


Plastics


PUR foam sample

[1] Evidence based in the assessment of waste guides
[2] Collection of fraction samples and laboratory analysis

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WEEE TREATMENT

Category 2 (CRT)

Depollution
- CRT glass
- Luminous layer
- Electric cable
- Capacitors
- Printed circuit board
- Plastics with brominated flame retardants

CRT screens and monitors

Manual dismantling → Ferrous metals, aluminum, coper, plastics, wood

CRT cut → Tube glass (with Pb)

Vacuuming → Frontal glass

Luminous layer

Manual dismantling

Tube dismantling

Glass cut and separation

Luminous layer vacuuming

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WEEE TREATMENT

Category 2 (Flat screens and monitors)

Depollution:

- Liquid crystal displays
- Electric cables
- Printed circuit boards
- Lamps
- Plastics with brominated flame retardants

Flat screens

Manual dismantling

Screen manual dismantling

Liquid crystal displays

Ferrous metals, aluminum, coper, plastics, glass

Manual dismantling

Components removal

Screen dismantling

Lamps removal

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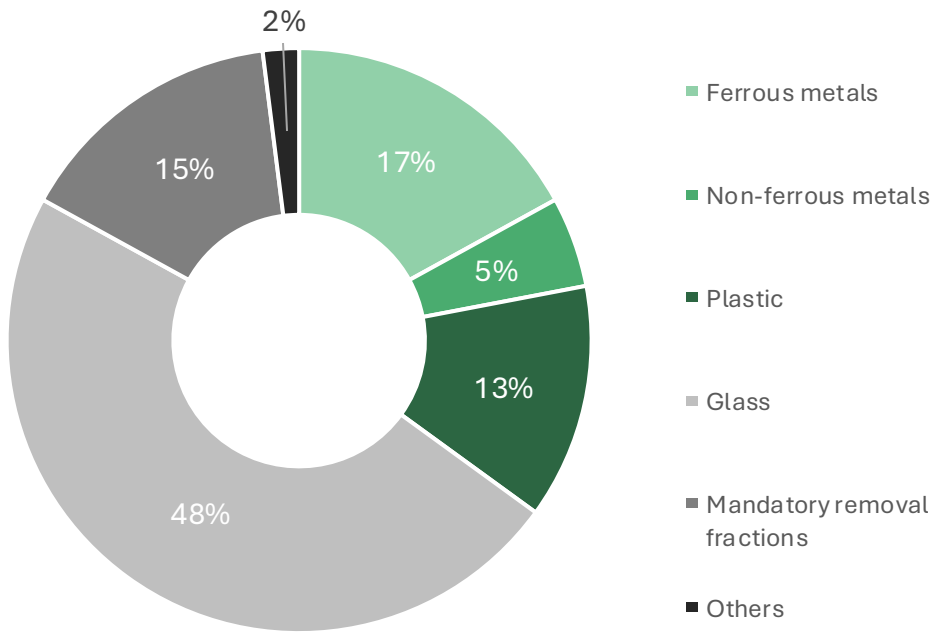
WEEE TREATMENT

Category 2

Material composition



Based on the amounts treated in 2023 (Electrão)

Main fractions with reference values defined by CENELEC standards:

Capacitors removal > 1 kg/t [1]

POP in plastic fraction < 50 mg/kg (PBB) and 500 mg/kg (PBDE) [2]

PB in the clean glass fraction < 0,5 % in weight [2]

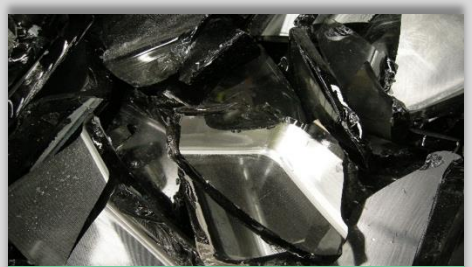
% intact lamp bulbs > 95% in weight


Tube glass


Plastics


Ferrous metals


Capacitors removal


Clean glass samples

[1] Evidence based in the assessment of waste guides
[2] Collection of fraction samples and laboratory analysis

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WEEE TREATMENT

Category 3 (Lamps)

Lamps (wet method)

- Fragmentation with aqueous solution
- Magnetic separation → Depollution:
  - Mercury (Hg)

Sludge with Hg, ferrous metals, non-ferrous metals, plastics, glass

Lamps (dry method)

- Fragmentation
- Magnetic separation → Ferrous metals
- Gravitational separation (air) → Phosphorus powder (with Hg)
- Eddy current separation → Non-ferrous metals

Glass (with plastics)

- Distillation → Depollution:
  - Mercury (Hg)

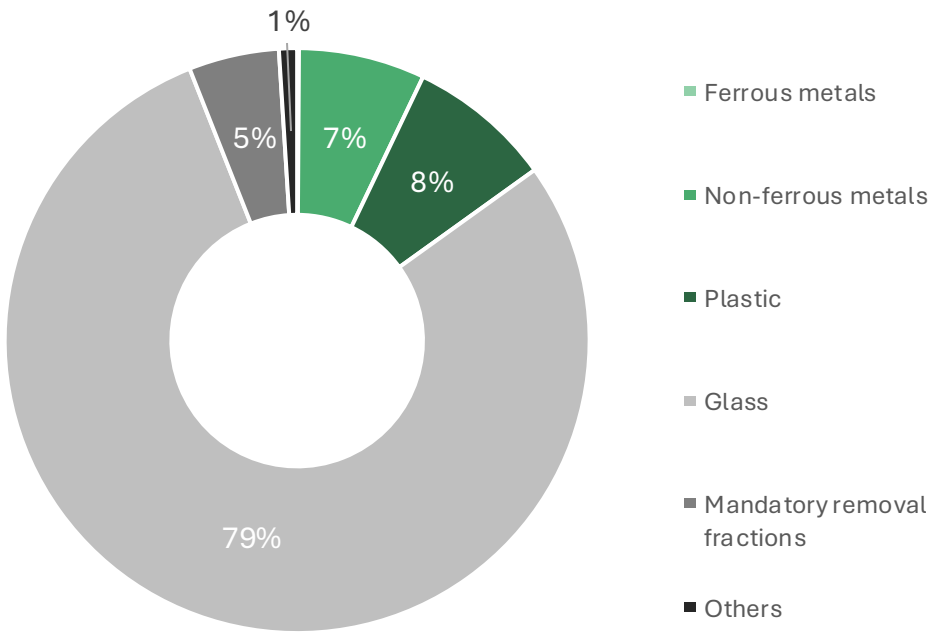
Phosphorus powder

https://www.youtube.com/watch?v=BZihmTuTX_s

WEEE TREATMENT

Category 3 (Lamps)

Material composition



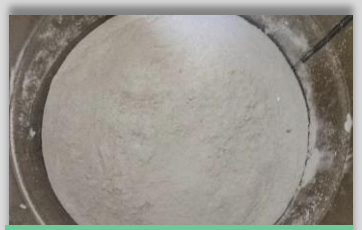
Based on the amounts treated in 2023 (Electrão)

Main fractions with reference values defined by CENELEC standards:

Mercury in glass fraction < 10 mg/kg [1]

Mercury in metals and plastics fractions < 100 mg/kg [1]


Glass


Sludges/Phosphorus powder


Non-ferrous metals


Hg in glass


Hg in metals and plastics

[1] Collection of fraction samples and laboratory analysis

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WEEE TREATMENT

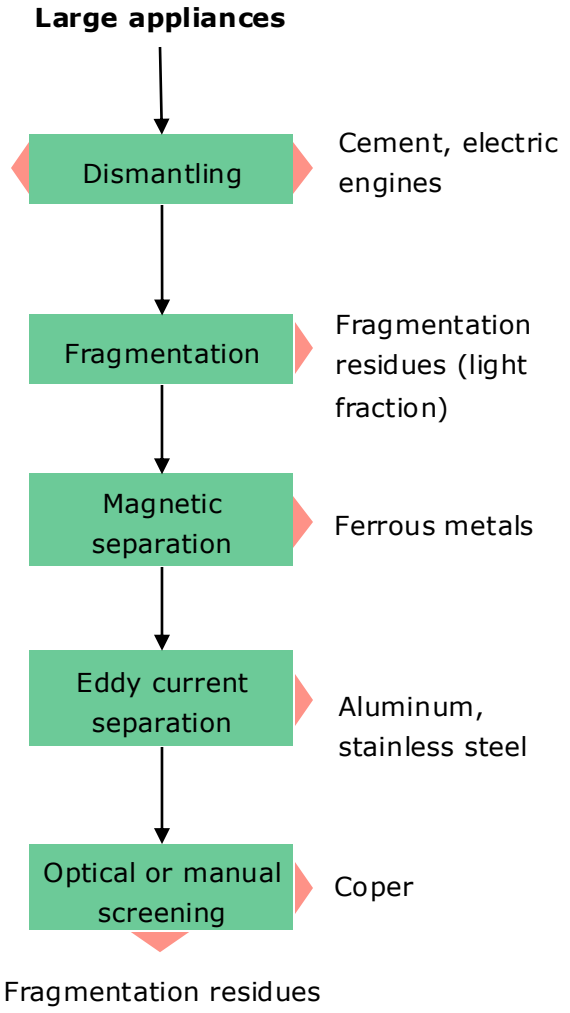
Category 4 (Large appliances)

Manual dismantling

Fragmentation

Depollution:

- Electric cables
- Capacitors
- Printed circuit boards
- Oil
- Lamps

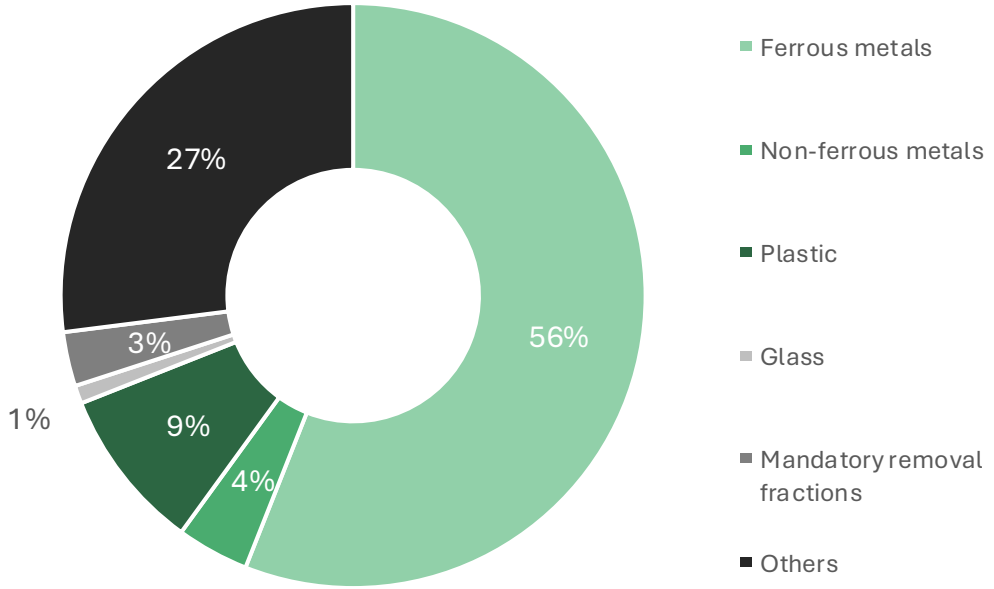


https://www.youtube.com/watch?v=d4nIeZHEj9c

WEEE TREATMENT

Category 4

Material composition



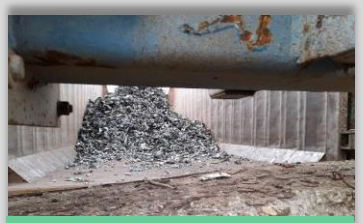
Based on the amounts treated in 2023 (Electrão)

Main fractions with reference values defined by CENELEC standards:

Capacitors removal > 1 kg/t [1]

PCB in fragmentation light fraction < 50 mg/kg [2]

Cadmium in fragmentation light fraction < 100 mg/kg [2]


Ferrous metals


Plastics


Inert


Capacitors removal


Light fraction samples

[1] Evidence based in the assessment of waste guides
[2] Collection of fraction samples and laboratory analysis

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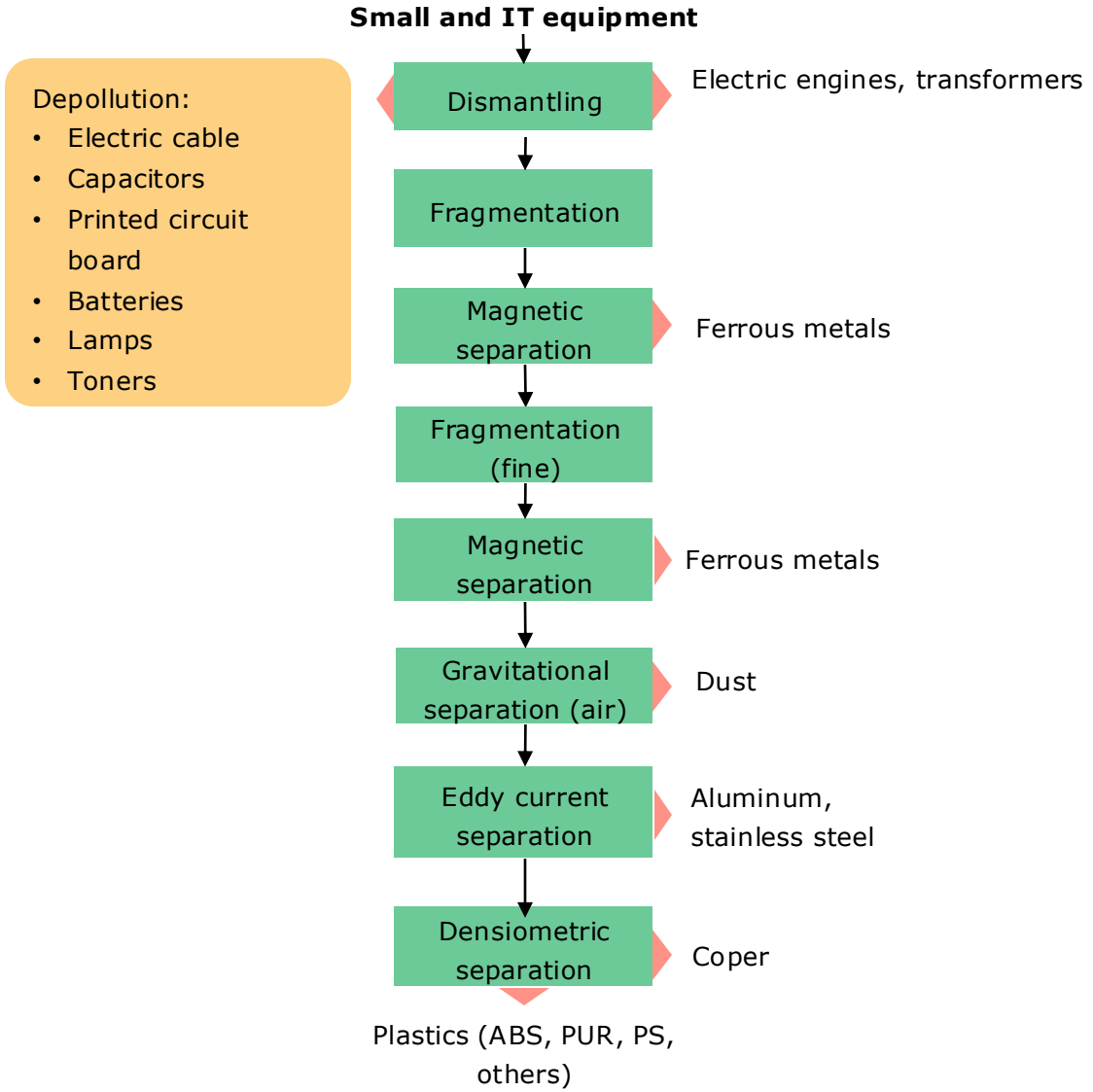
WEEE TREATMENT

Category 5 and 6 (Small and IT equip.)



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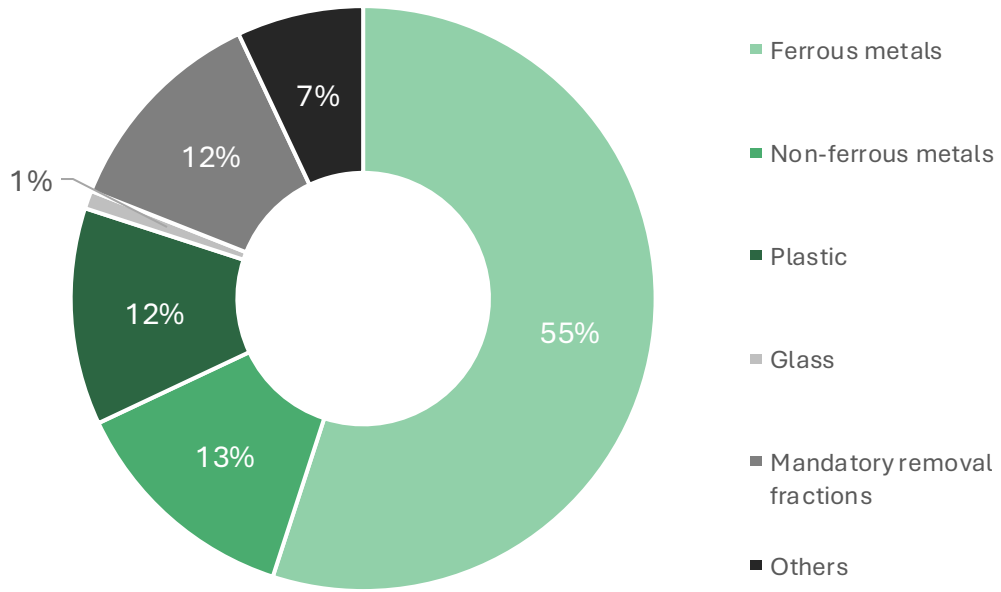
https://www.youtube.com/watch?v=P_EoUAVFJSY

WEEE TREATMENT

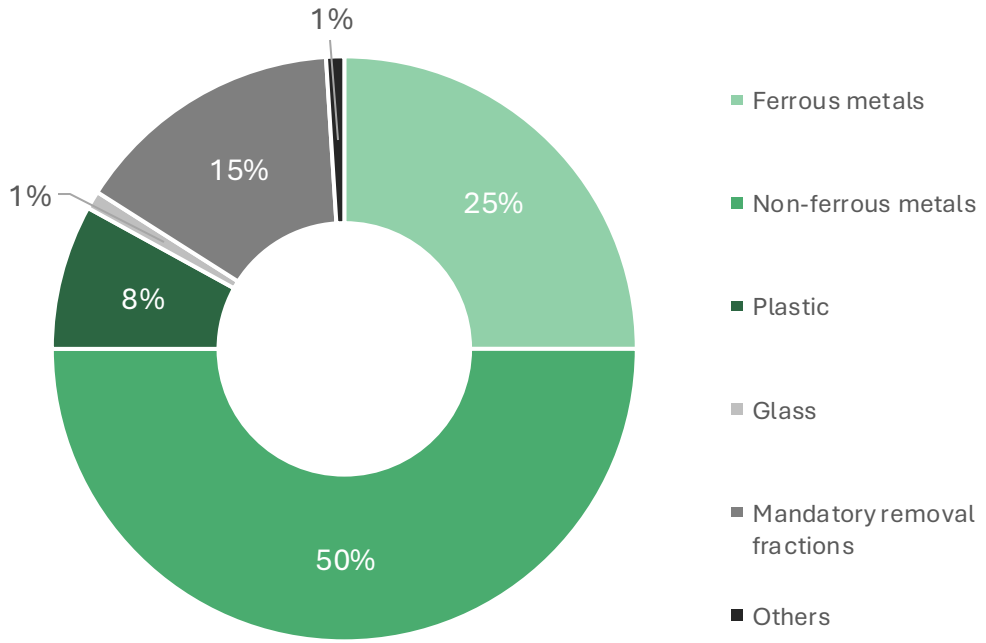
Category 5 and 6

Material composition (Cat 5)



Based on the amounts treated in 2023 (Electrão)

Material composition (Cat 6)



Based on the amounts treated in 2023 (Electrão)

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WEEE TREATMENT

Category 5 and 6

Main fractions with reference values defined by CENELEC standards:

Capacitors removal > 1 kg/t [1]

Batteries removal > 1,8 kg/t [1]

POP in plastic fraction < 50 mg/kg (PBB) and 500 mg/kg (PBDE) [2]

PCB in fragmentation light fraction < 50 mg/kg [2]

Cadmium in fragmentation light fraction < 100 mg/kg [2]

Batteries removal

Plastic fraction sample

[1] Evidence based in the assessment of waste guides
[2] Collection of fraction samples and laboratory analysis

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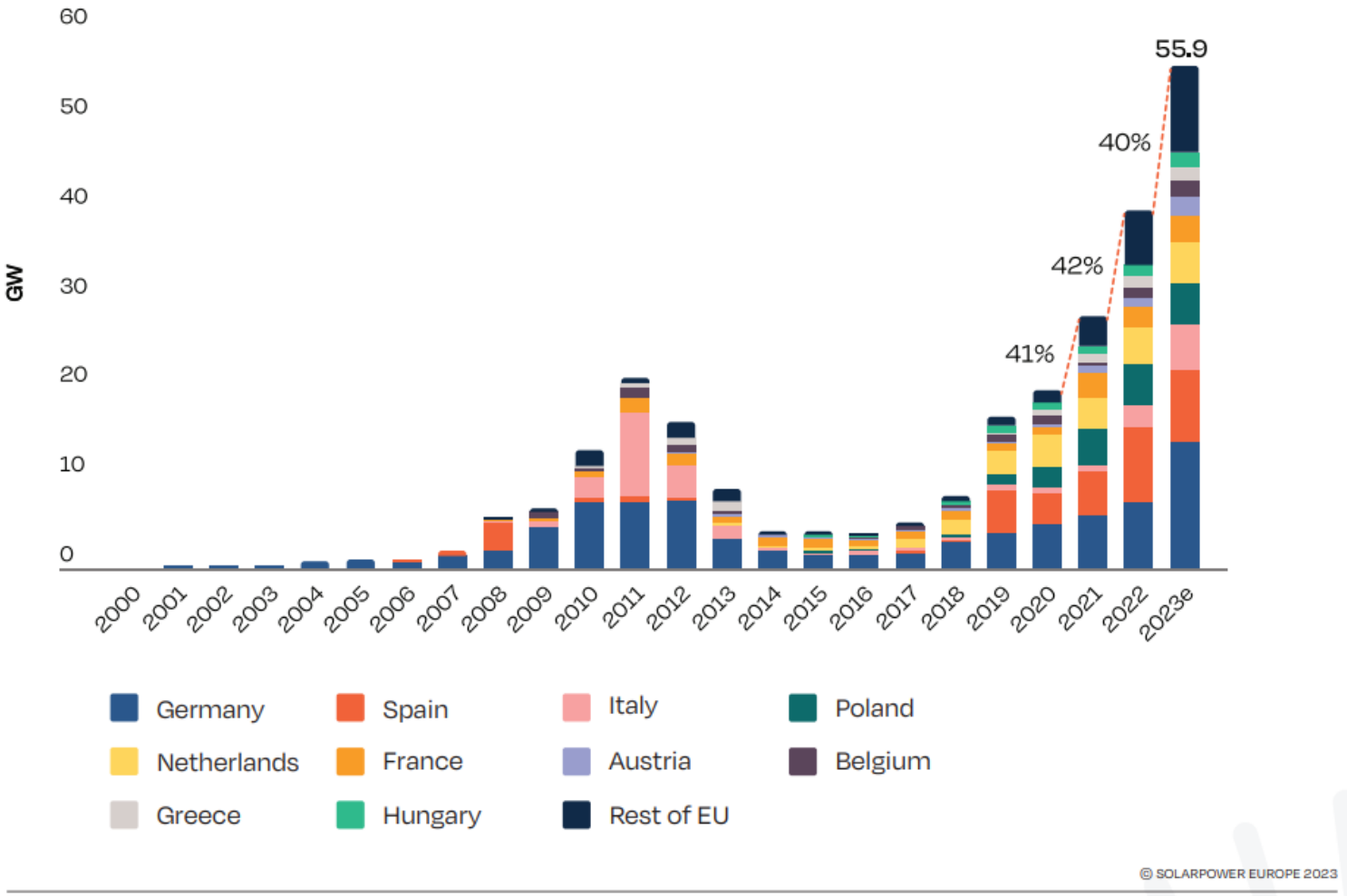
WEEE TREATMENT

Photovoltaic panels

The solar industry has seen unprecedented growth in recent years, being one of the pillars of the energy transition strategy. In 2023 alone, more than 55 GW were installed in Europe, breaking another record. There are now around 263 GW of installed capacity in Europe.

Challenge

What to do when all these panels reach the end of their useful life?

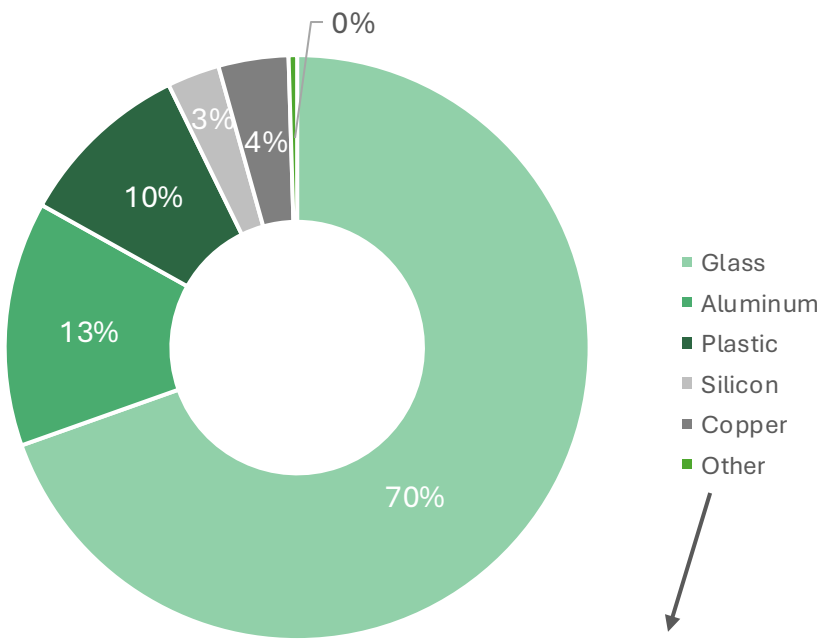


EU 27. Installed capacity of photovoltaic solar energy (Source: SolarPower Europe 2023)

WEEE TREATMENT

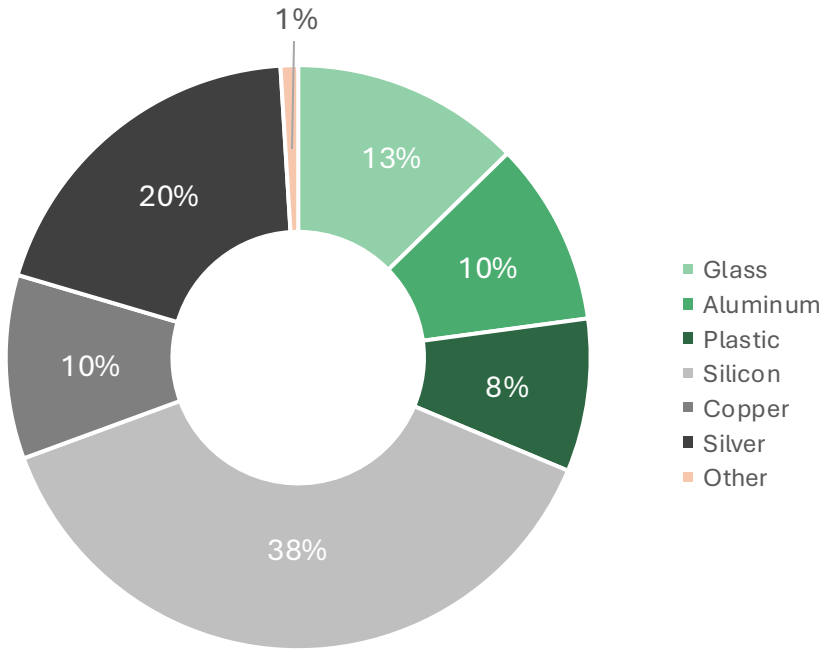
Photovoltaic panels

Material composition



Silver
Zinc
Lead
Indium
Tellurium

Value composition



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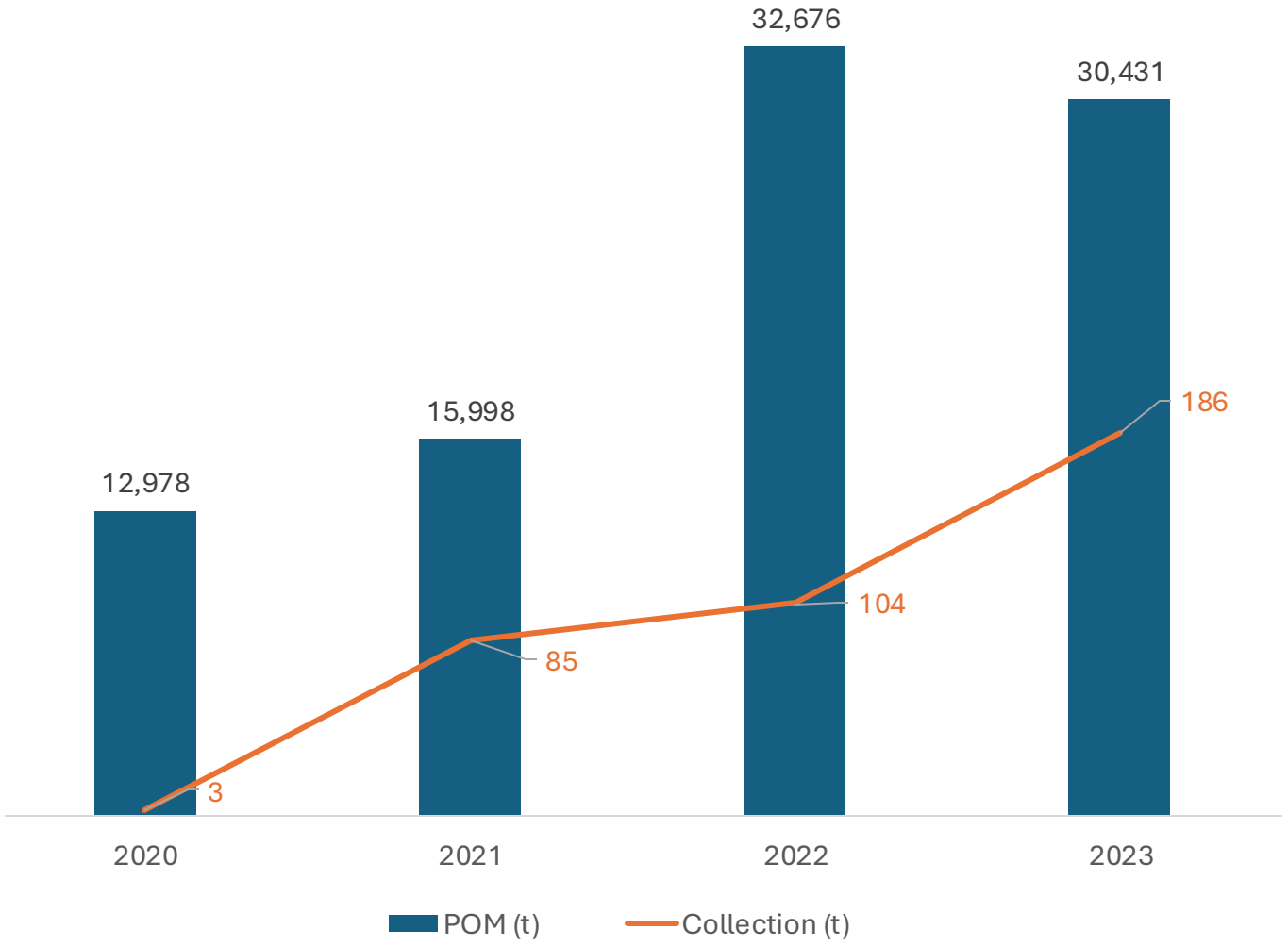
WEEE TREATMENT

Photovoltaic panels – Electrão data



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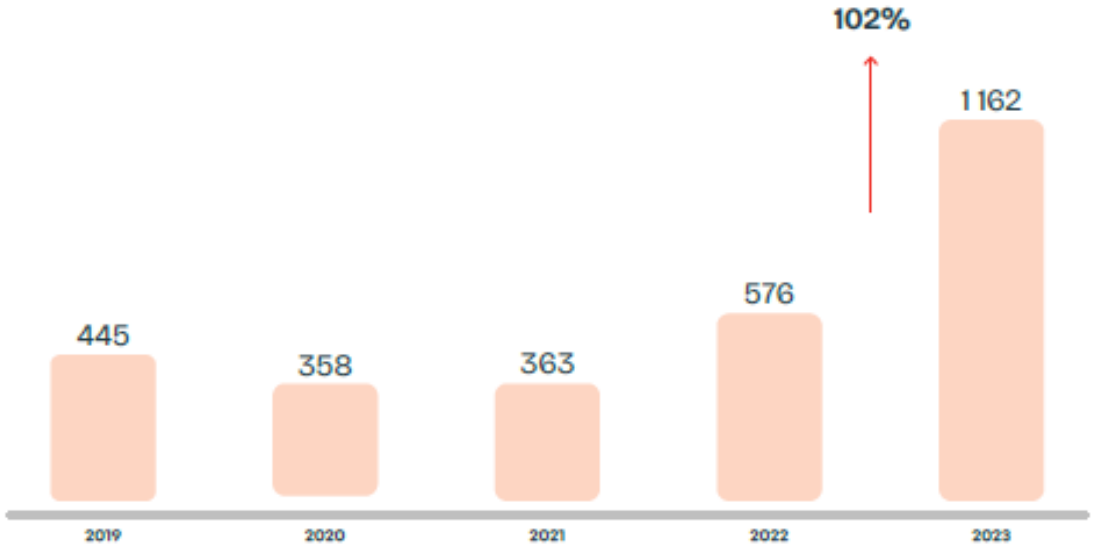
ELECTRÃO TREATMENT RESULTS 2023

Preparation for reuse

In 2023, with the implementation of the Electrão Reuse Center, and the several protocols established with electric producers, it was possible to achieve a maximum value of reused equipment, from the beginning of the activity. The amount of equipment reused in 2023 more than doubled compared to 2022, representing an increase of 102%.



Electrão Reuse Center

The Reuse Center promotes actions to prevent production waste and reuse. During the year 2023, Electrão defined selection criteria for electrical equipment and electronic devices capable of being reused, as well as the requirements and routing traceability monitoring circuits of these wastes, and their respective components, with the aim to increase reuse potential.

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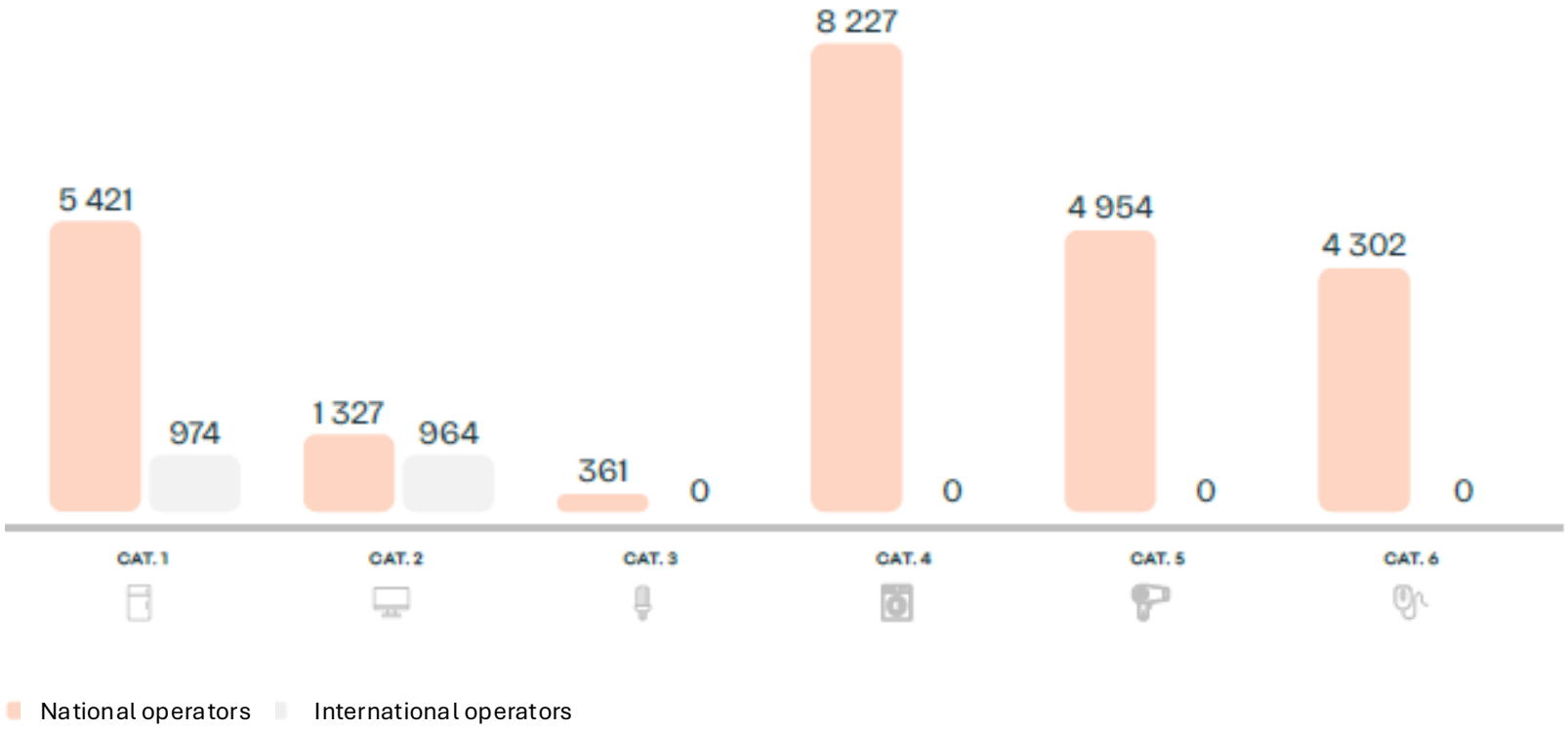
ELECTRÃO RESULTS 2023

TREATMENT AND RECYCLING



National operators

24 592 ton

International operators

1 938 ton

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ELECTRÃO RESULTS 2023

MANDATORY REMOVAL FRACTIONS

Mandatory removal fractions

4 895 ton represent ⟶ **18,4%**

Treated equipment

9,7 ton
0,04%
Condensadores

34 ton
0,1%
Componentes contendo mercúrio

256 ton
1%
Pilhas e baterias

755 ton
2,8%
Placas com circuitos impressos

596 ton
2,2%
Plástico contendo retardadores de chama bromados

96 ton
0,4%
Lâmpadas de descarga de gás

1 463 ton
5,5%
Tubos de raios catódicos - Vidro de tubo; Vidro Frontal; Pó fluorescente.

55 ton
0,2%
CFC/HCFC/HFC/HC

14 ton
0,1%
Ecrãs de cristais líquidos

831 ton
3,1%
Cabos elétricos

765 ton
2,9%
Cartuchos de toner/tinteiros

16 ton
0,1%
Óleo

3,7 ton
0,01%
Condensadores Electrolíticos

ELECTRÃO RESULTS 2023

RECICLED MATERIAL

After removing the mandatory removal fractions from the 6 electrical equipment categories, these are subject to a sequence of operations that allow the materials that constitute them to be recovered and that can be recycled or recovered.

22 763 ton

Ferrous metals
11 761 ton

Non-Ferrous metals
3 701 ton

Plastics
3 367 ton

Glass
1 448 ton

Others
1 823 ton

Mandatory removal fractions
663 ton

The values presented are not real data and result from an estimate made based on a balance sheet. system.

ELECTRÃO RESULTS 2023

RECYCLING AND RECOVERY RATES

The substances and materials that constituted electrical equipment, and which were removed and recovered during the treatment process, were subsequently sent for recycling or recovery, and a small part for disposal. Considering the final destination of these materials, the Electrão recycling and recovery rates are:

76%
RECYCLING RATE

83%
RECOVERY RATE

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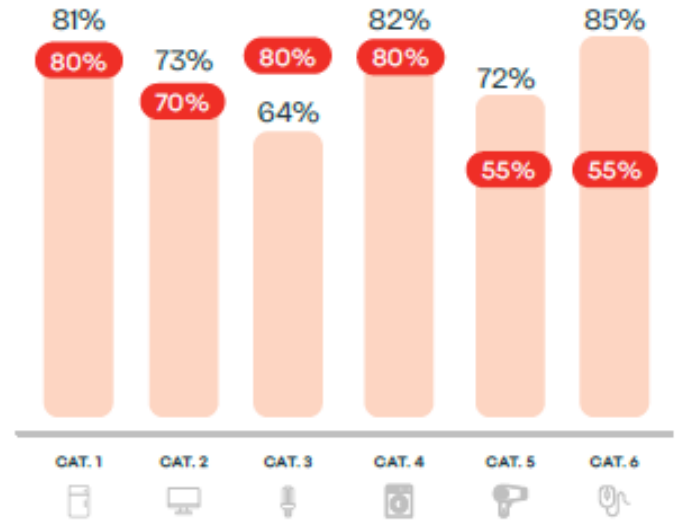
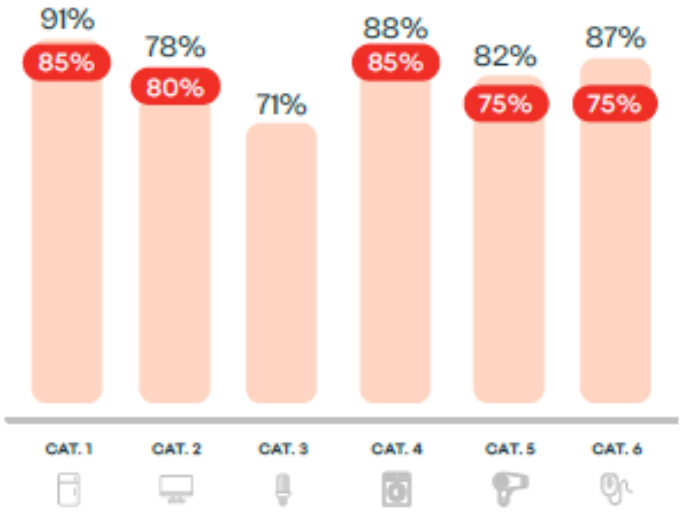
Reuse/Recycling Rate



Recovery Rate



ELECTRÃO RESULTS 2023

DEPOLLUTION RATE

During 2023 there were removed and sent for recycling and specific treatment 4,895 tons of mandatory removal fractions which corresponds to 18.5% depollution rate.

Mandatory removal fractions

4 895 ton

Depollution rate

18,5 %

of treated equipment

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Electrão monitored the removal and respective forwarding of a set of fractions, in accordance with the established requirements, counting only amounts of mandatory removal fractions that are proven by waste transport guides.

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