CEWASTE

Voluntary certification scheme for waste treatment

TRAINING MATERIAL FOR THE PILOTING TEAM

DELIVERABLE 4.2

This project is received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement Nº 820859

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Table 1: Version History

Ver. no.	Date	Reasons for release	Responsible
0.0	20.04.20	Initial draft with content	LBE
0.1	21.04.20	Review initial draft	EST
0.2	22.04.20	Review initial draft	AHA
0.3	23.04.20	Consolidate internal feedback Sofies	LBE
Final	27.04.20	Consolidated version with Feedback from EERA and SGS	LBE

NOTICE

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ACRONYMS

CRM	Critical Raw Material
EEE	Electrical and Electronic Equipment
ELV	End-of-life Vehicle
LA	Lead auditor
LTP	Linked third party
WEEE	Waste Electrical and Electronic Equipment
WP	Work package

1 SUMMARY

The H2020-project CEWASTE aims to develop, test and validate a certification scheme with requirements enabling the recycling of valuable and critical raw materials - CRMs. In the fourth work package, the consortium is validating the new voluntary certification scheme through pilots with stakeholders selected from the pool of project partners, chief among them the members of the European Electronics Recyclers Association (EERA), the WEEE Forum, and the Advisory Board. In addition, interested and qualified external auditors were invited to participate in training sessions and pilots. The objectives of Work Package 4 (WP4) include:

- validate the normative requirements (WP2) and the assurance system (WP3) through targeted pilots,
- analyse the outcome of the pilots and improve the voluntary scheme according to its findings,
- develop a roadmap including recommendations for amending existing mechanisms (legislation, guidelines, standards and initiatives) with the new requirements and a plan for the future roll-out of the voluntary certification scheme.

Task 4.1 focuses on the preparation and planning of the pilots and includes the development of training materials and dedicated training sessions for auditors, following assurance and verification procedures and tools developed in Task 3.3 to ensure consistency in the approach. Training sessions are designed for members of the consortium involved in the piloting (Task 4.2) as well as external auditors selected for the pilot phase. Furthermore, a training session for companies that will be audited is offered, to inform them on CEWASTE requirements and give the operators guidance for their audit preparation. Plan and content of these training sessions are included in the current report.

The organisations and companies targeted for audits are selected together with members of EERA and the WEEE Forum, ensuring full coverage of the collection, logistics, pre-treatment and final treatment stages, diversity in size and geography of facilities, and other criteria defined in order to ensure that the applicability of the scheme is as wide as possible.

The requirements developed in WP2 and procedures and tools developed in WP3 – including the audit procedure – are tested in real-world situations during the pilot audits of task 4.2. The pilot audits will also provide feedback and relevant data to Task 4.3 and Task 4.4.

2 INTRODUCTION

2.1 THE CEWASTE PROJECT

The CEWASTE project contributes to the recycling improvement of valuable and critical raw materials (CRMs)[1] from key types of waste through certification of traceable and sustainable treatment processes in the entire supply chain of secondary raw materials. CEWASTE addresses the specific challenge to secure the sustainable access to CRMs for the EU economy as well as objectives set by the EU action plan for the Circular Economy, the issue of illegal trade of wastes within the EU and to non-EU countries, and the need to support the development of environmentally and socially sound recycling systems globally.

Specifically, the project will develop, validate and launch a voluntary certification scheme for collection, transport and treatment facilities of key types of waste containing significant amounts of valuable and critical raw materials. To ensure a comprehensive approach and a robust result, the project will be developed along the following six specific objectives:

- **Objective 1:** Understand existing recovery practice, standards and verification schemes related to valuable and critical raw materials and how these can be leveraged for CEWASTE.
- **Objective 2:** Leverage existing normative requirements to develop technical, sustainability and traceability requirements for the voluntary certification scheme.
- **Objective 3:** Develop an assurance system and related verification procedures that effectively ensure that facilities and raw material streams are compliant with sustainability and traceability requirements.
- **Objective 4:** Validate the new voluntary scheme through pilots with selected and committed stakeholders of the value chain.

[1] For the list of CRMs see https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en - the current version was published in 2017

- **Objective 5:** Ensure long term sustainability of the scheme, reflecting on the needs from existing governance mechanisms, and resulting in a roadmap addressing the amendments of new requirements or mechanisms needed.
- **Objective 6:** Ensure a transparent stakeholder process that allows for broad acceptance and dissemination of the essentials of the scheme.

CEWASTE will deliver tangible results in the form of reports, a set of rules (normative requirements), related administrative and procedural mechanisms to ensure compliance with the rules, practical guidelines, and an implementation plan as outlined in detail in the work plan of project's Grant Agreement. In addition, the project will produce a series of recommendations as part of these results. Face to face events, presentations, webinars, and publications will support project implementation, enabling stakeholder participation, communication, dissemination and the launch of the scheme.

CEWASTE will not develop the new voluntary scheme from scratch nor formally amend existing standards. In view of the two years implementation condition set by the call, the project will focus on developing the scheme based on the current developments in recovery technologies and on the existing normative landscape in the field of waste treatment and responsible sourcing of raw materials, while presenting a clear roadmap for necessary amendments of existing mechanisms and a large-scale roll-out of the scheme. This strategy will ensure that despite the limited resources, the specific objectives as presented above can be achieved in a realistic timeframe.

The CEWASTE consortium[2] shall develop the scheme until 30 April 2021.

[2] The owner of the scheme shall be determined at a later stage of the project.

2.2 PURPOSE OF THIS DELIVERABLE AND OVERVIEW OF WORK PACKAGE 4

The current Deliverable 4.2 is the second of four deliverables within WP4. In WP4, the consortium is validating the normative requirements (WP2) and the assurance system (WP3) of the new voluntary certification scheme through targeted pilot audits. The goal is to improve the scheme based on the analysis of the results of the pilot audits.

Task 4.1 focused on the preparation and planning of the pilot audits as well as the preparation of training material. Deliverable 4.1 presented the validation methodology for the preparation and planning of the pilot audits. This deliverable 4.2 presents the developed training materials and the content of five online seminars conducted for the lead and external auditors as well as the auditees. The planning and preparation steps of the pilot audits are illustrated in Figure 1.

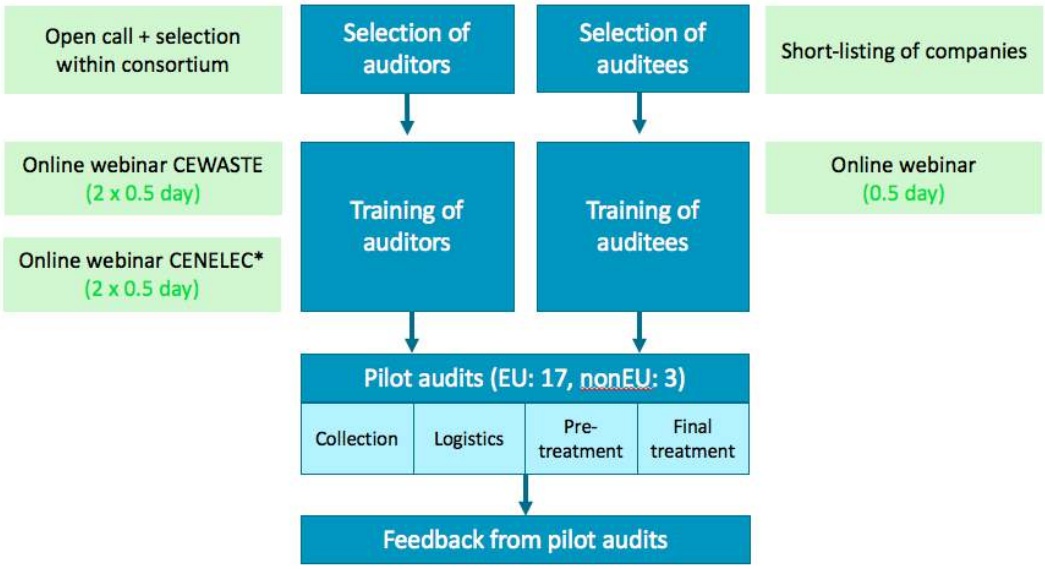


*Figure 1: Methodology for the preparation and planning of the pilot audits, as well as the plan for the training sessions organized in form of online webinars (*auditees not certified according to EN 50625 also participated in the CENELEC online webinar organised for auditors).*

Task 4.2 will include the actual pilot-testing of the CEWASTE requirements through 20+ on-site audits, whereas feedback from the pilot phase will be consolidated in Task 4.3, resulting in deliverable 4.3 (Piloting reports and maturity level assessment). Task 4.4. finally assesses the long-term sustainability of the scheme and compiles its results in deliverable 4.4 (Roadmap for the long-term sustainability of the scheme).

3 TRAININGS OF AUDITORS

After selecting the auditors[3], it was essential to introduce them to the CEWASTE requirements, including the EN 50625 standard series. The CEWASTE normative requirements is based on the European Standards on Collection, Logistics and Treatment Requirements for WEEE (EN 50625) approved by CENELEC (European Committee for Electrotechnical Standardization) on 2014-01-27. The goal of the trainings was to familiarize the participant with the requirements and share guideline behaviours for the upcoming pilot audits. The trainings were divided into four online webinars of 2 to 4 hours. The first two online webinars were dedicated to the CEWASTE requirements, while the last two offered a summary of the standards of the EN 50625 series. The content of the four webinars is summarized in the following sections, while the slides developed for the trainings are attached in Annexes A, B, C and D.

3.1 CEWASTE WEBINARS

To offer a comprehensive overview of the CEWASTE requirements, the trainings were divided into two parts focusing on: Management requirements and Technical requirements. In a first step, the training material in the form of PowerPoint presentations was created. For the presentation, particular attention was put on the exhaustive coverage of the requirements and the integration of practical examples of checklist questions. These webinars focused on the newly developed CEWASTE requirements (V6), while requirements that are based on the EN 50625 standard series were covered in the EN 50625 standard training sessions.

[3] Details about the process and criteria for selection of the auditors is explained in “Deliverable 4.1- Validation Methodology for the Pilots”.

3.1.1 WEBINAR ON CEWASTE MANAGEMENT REQUIREMENTS (ANNEX A)

The CEWASTE management requirements webinar took place on March 17th 2020 from 9am to 12pm. It was led by Sofies via the online video communication tool Zoom.us. The outline of the webinar is shown in Figure 2.

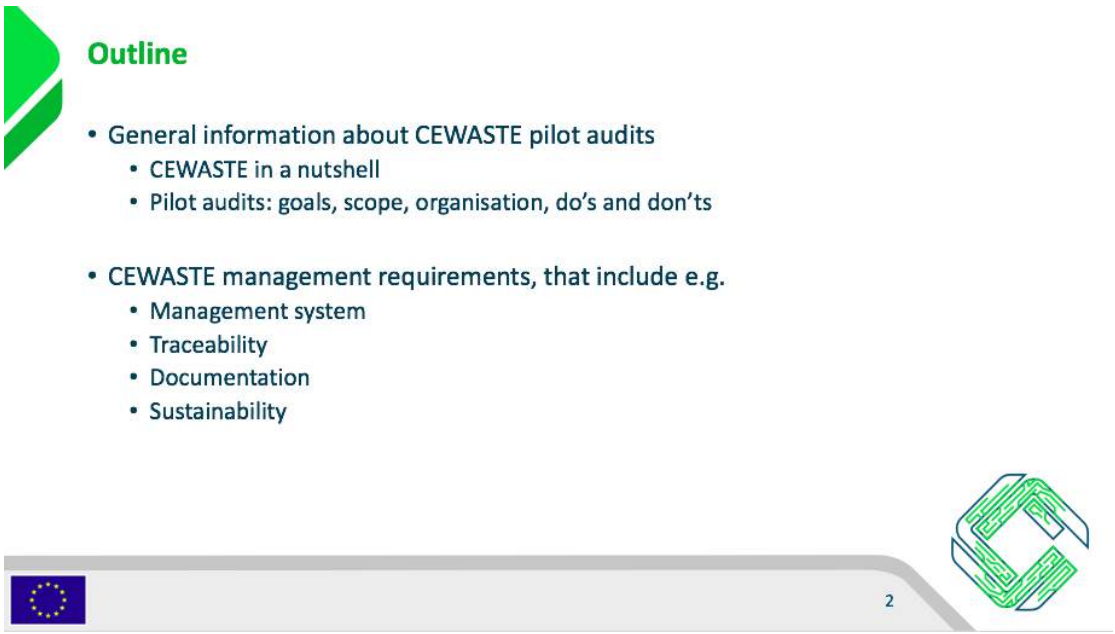


Figure 2: Content of the CEWASTE webinar covering the management requirements

It was important to start with a broad introduction to the CEWASTE project and its objectives to allow each selected auditor gain awareness on their responsibilities in the pilot audit. The approach, the processes and scope of CEWASTE as well as the current status of the project were presented. Additionally, the goal, scope and organisation of the pilot audit phase were discussed. One slide particularly reminded the participants on their expected behaviour during the upcoming audits. A list of dos and don'ts was used to offer a short auditing guideline for the selected auditors. Finally, the management requirements were presented step by step following the structure of the CEWASTE requirements (as outlined in the WP2 deliverable). From the management system to the sustainability requirements, the selected auditors received an exhaustive overview of the requirements, as well as insights in the checklist questions, which will be used to conduct the audits.

3.1.2 WEBINAR ON CEWASTE TECHNICAL REQUIREMENTS (ANNEX B)

The CEWASTE webinar on the technical requirements took place on March 24th 2020 and was also led by Sofies via the video communication tool Zoom.us. The presentation covered all technical

requirements new to CEWASTE, which were not already encompassed by the EN 50625 standards. The content of the presentation is visible in Figure 3.

Figure 3: Content of the CEWASTE technical requirement webinar.

Similar to the first webinar, examples of checklist questions were included to familiarise the auditors with the auditing material. Questions and remarks from the auditors were appreciated and discussed during both webinars.

3.2 EN 50625 STANDARDS WEBINARS

The EN 50625 standards trainings were also divided into two webinars due to the wide numbers of requirements included in the EN 50625 standard. The webinars were designed for non - EN50625-certified auditors as the important part of the CEWASTE requirements are based on CENELEC. Thus, the knowledge of EN 50625 standards is a prerequisite for the understanding of CEWASTE. The two webinars took place on April 3rd and 7th 2020 and were led by the WEEELABEX Organisation[4].

3.2.1 WEBINAR ON EN 50625 STANDARDS: INTRODUCTION, ADMINISTRATIVE & ORGANISATIONAL REQUIREMENTS (ANNEX C)

The first webinar covered the introduction to the EN 50625 standards in general and presented the administrative and organisational requirements. For example, the requirements for a management system, for the development of a risk assessment or for specific documentation were presented in the webinar.

3.2.2 WEBINAR ON EN 50625 STANDARDS: COLLECTION & LOGISTICS, TECHNICAL REQUIREMENTS (ANNEX D)

The second webinar included the collection and logistics requirements as well as the technical requirements during operation. For collection and logistics phases, the standard covers the requirement for material acceptance, handling, storage and sorting of WEEE. The technical requirements during operation mainly include depollution and recovery of output fraction requirements.

[4] WEEELABEX is an international non-profit legal entity. They qualify auditors in the WEEELABEX standard and promote the adoption of these standards by operators and member states as a means to improve WEEE management practices in Europe.

4 TRAININGS FOR AUDITEES

A CEWASTE training webinar led by Sofies will also be organised for auditees to prepare them for the upcoming pilot audits and to familiarise them with the expectations of the CEWASTE certification scheme. The half-day online webinar will provide an overview of the CEWASTE management and technical requirements. The presentation for the auditees training consists of a shorter version of the two CEWASTE webinars designed for the auditors, which are visible in Annex A and B of this report.

As the CEWASTE requirements are based on the EN 50625 standards, it is important for auditees non-compliant with the EN 50625 standard to understand which requirements will be audited in the pilot phase (see 3.2 for the EN 50625 standards webinar content). Therefore, the auditees, which are not CENELEC certified, took part as well in the EN 50625 standards webinar for auditors.

ANNEX A: WEBINAR ON CEWASTE MANAGEMENT REQUIREMENTS

CEWASTE

Audit training Webinar

Part I: General information & Management requirements

Arthur Haarman, Esther Thiébaud, Laura Beyeler

Sofies

sofies
leading sustainability

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 820859

Outline

- General information about CEWASTE pilot audits
  - CEWASTE in a nutshell
  - Pilot audits: goals, scope, organisation, do’s and don’ts

- CEWASTE management requirements, that include e.g.
  - Management system
  - Traceability
  - Documentation
  - Sustainability

Info Coronavirus

- Current situation will have important impacts on the CEWASTE project
- Especially on the pilot auditing phase, supposed to run from March until June 2020 and include 20+ audits over 8 countries (BEL, CH, COL, IT, PT, RWA, TUR)
- Most of the planned pilot audits will probably have to be postponed, or replaced by self-assessments + interviews
- We are currently working on a plan B (or plan C) and will inform external auditors as soon as a decision is reached
- Please do not book any flights, trains, hotels, etc. for now
- Training webinars should be conducted as planned.

CEWASTE in a nutshell

(more info: https://cewaste.eu)

Main Objective of the CEWASTE Project

The project “Voluntary Certification Scheme for Waste Treatment” (CEWASTE) aims to **develop and validate** a **voluntary certification scheme** for collection, transport and treatment facilities of key types of waste containing significant amounts of **valuable and critical raw materials (CRMs).**

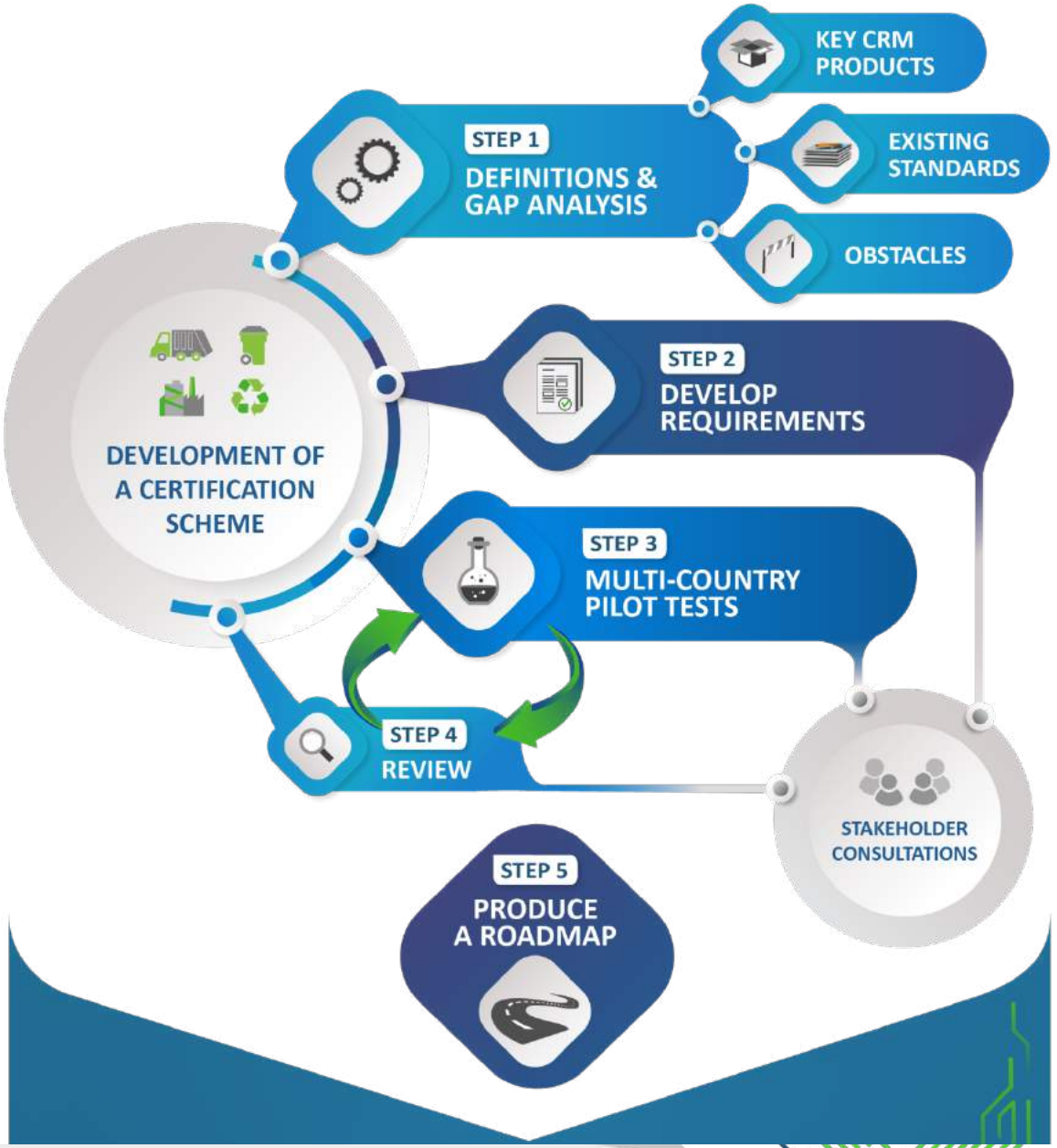
CEWASTE will not develop the new voluntary scheme from scratch nor formally amend existing standards. The project will focus on developing the scheme ***based on the current developments in recovery technologies and on the existing normative landscape*** *in the field of waste treatment and responsible sourcing of raw materials.*

Response to which challenges?

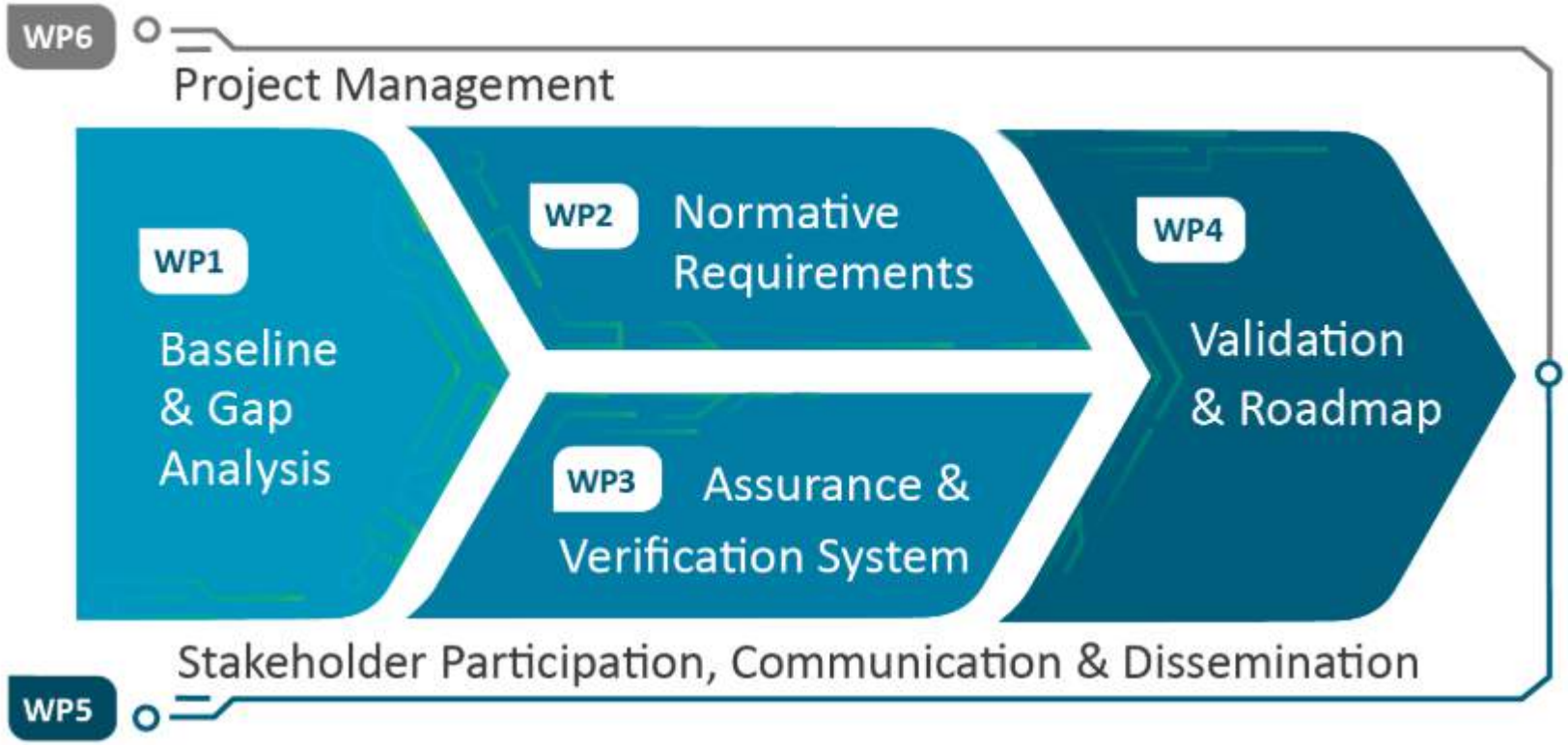
- Need for sustainable access to valuable and critical raw materials (CRMs) for the EU economy,
- CRMs not circular in Europe
- Need for standardization activities in support of policy actions
- Need to support the development of environmentally and socially sound recycling systems globally.

Approach

- **Understand existing recovery practices, standards and verification schemes**
- Leverage existing normative requirements to **develop new requirements for CRM recycling**
- Develop an **assurance system and related verification procedures**
- Validate the new voluntary scheme through **pilots**
- Ensure long term sustainability of the scheme, resulting in a **roadmap**
- Ensure a **transparent stakeholder process**



Project Structure and Timeline



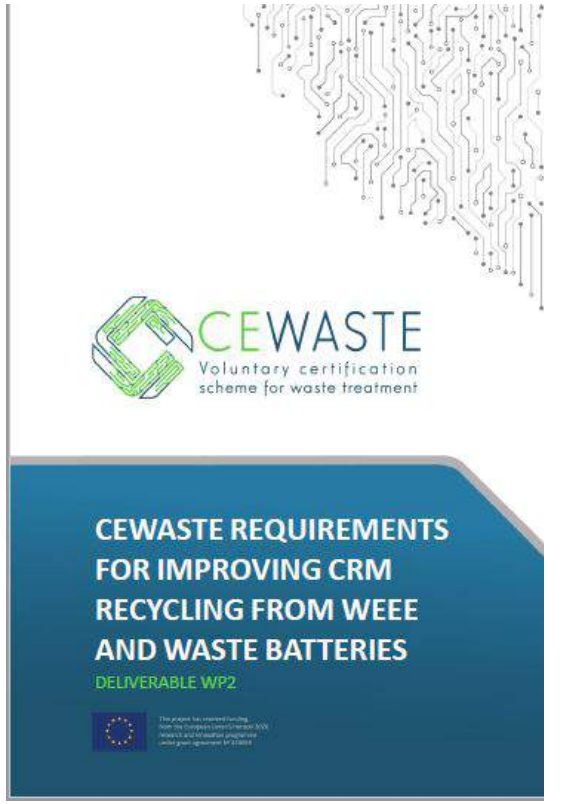
Start: Nov. 2018

End: Nov. 2020

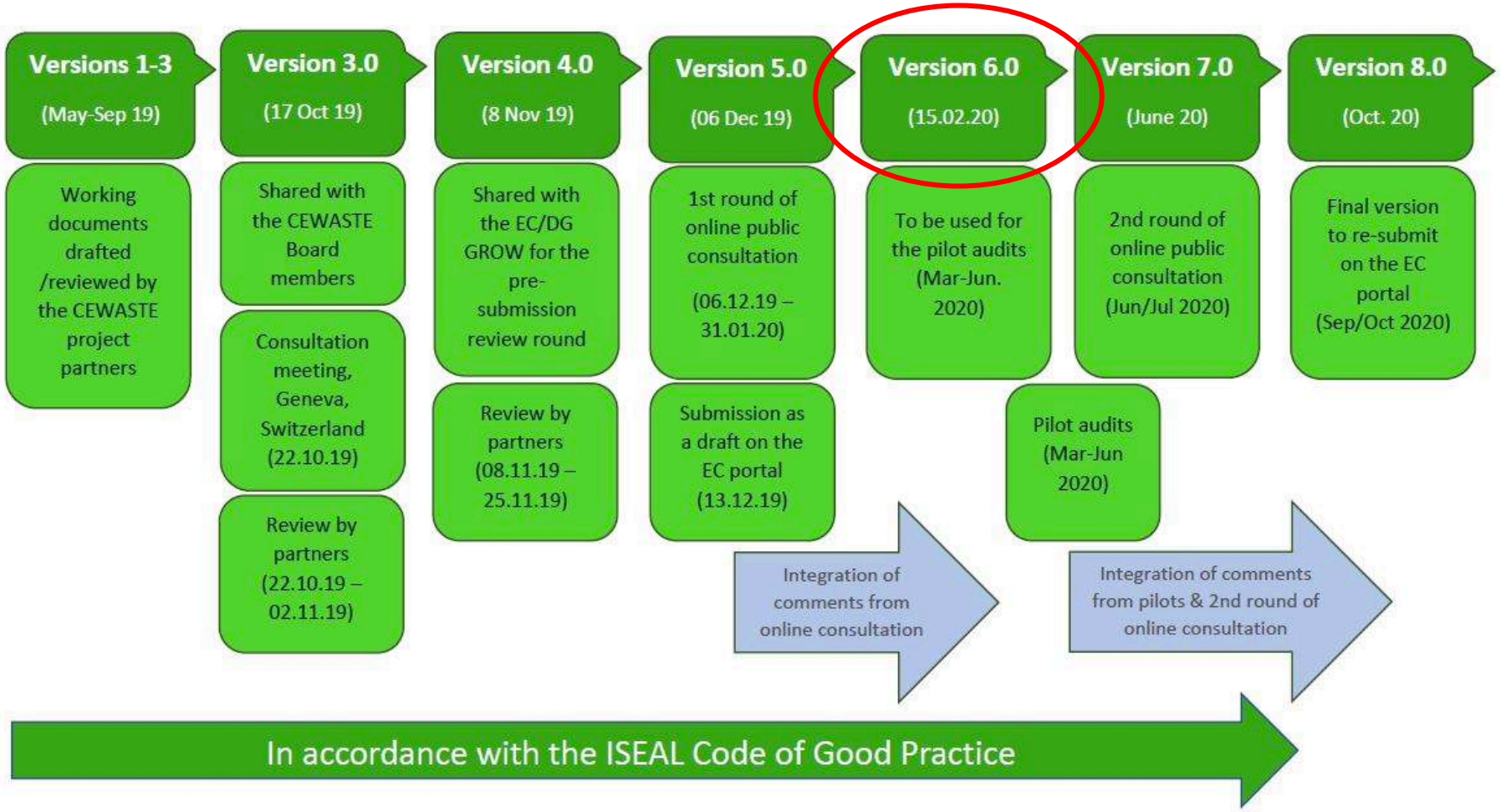
CEWASTE Requirements

- CEWASTE has developed a set of **managerial, environmental, social, traceability and technical requirements** and accordingly has established an assurance and verification system and related verification mechanisms.
- The project has taken stock of the normative requirements defined in existing relevant guidelines and standards in the field of electrical and electronic waste treatment - among others, the CEWASTE document is built on the **EN 50625** standard series
- Only where these are not sufficient to meet all the project's objectives, have **new requirements** been developed (with a focus on CRM recovery).

(V6 available on shared Dropbox folder)



CEWASTE Requirements: multi-stakeholder process



CEWASTE Scope

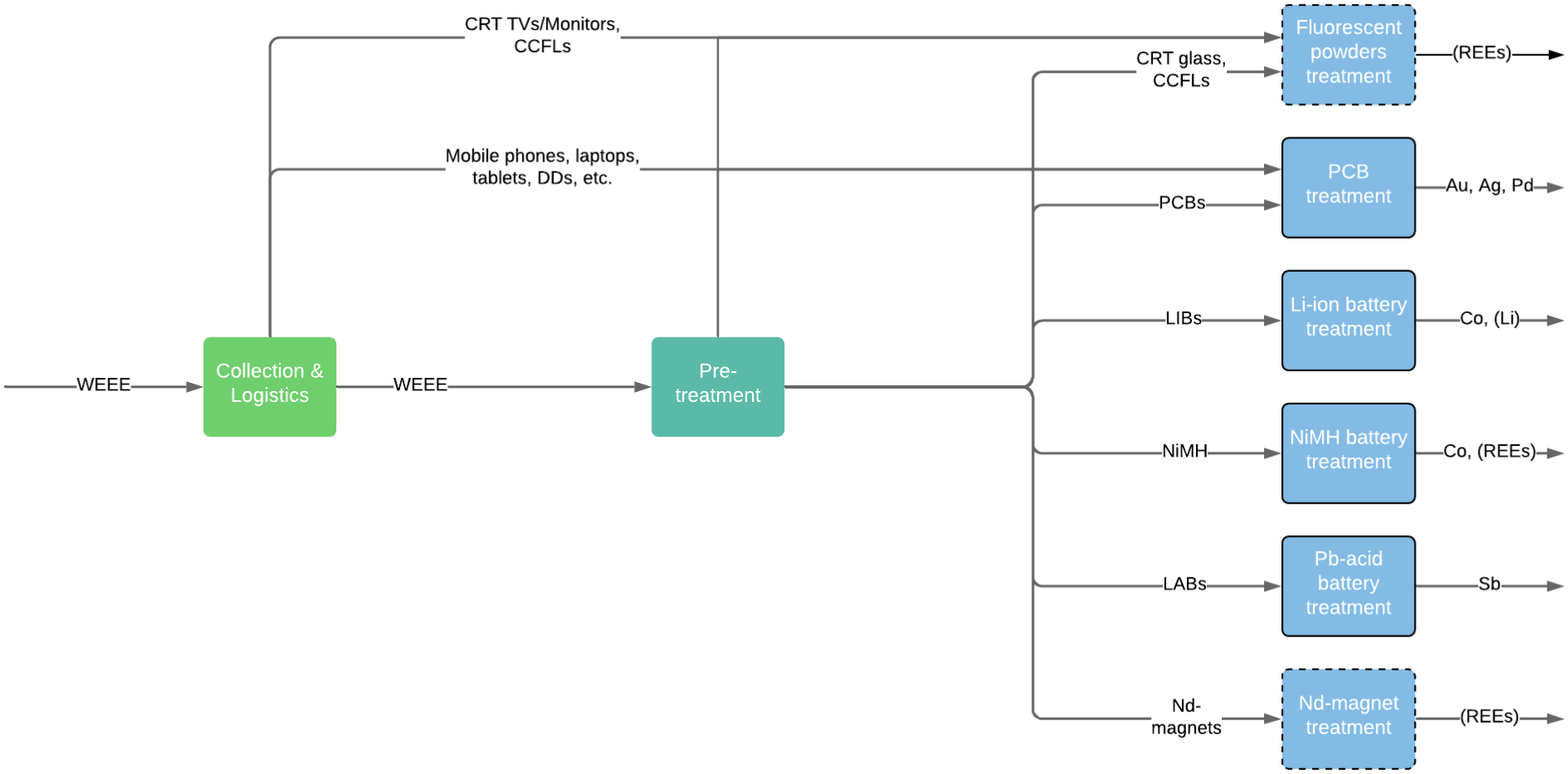
Selection criteria:

- Technology readiness of final recovery >7
- Pre-treatment can provide required inputs for final treatment
- Economic feasibility not necessary, however “hopeless cases” excluded (also includes cases where CRM recovery conflicts with precious metal recycling)

Source Comp.	Key CRM Equipment	Waste Type	CRMs	Required/Viable Input for End-processing	Current Economic Feasibility
Fluorescent powders	Fluorescent lamps	WEEE	Eu, Tb, Y, Ce, La	Fluorescent powder	No*
	CRT monitors and TVs		Y, Tb, Eu, Gd,La, Ce	Fluorescent powder	
Nd-magnets	Temperature exchange equipment (engine, compressor)	WEEE	Nd (+ Dy, Gd, Pr, Tb)	Magnets	No
	Household appliances other than temperature exchange equipment (motors/drives)				
	Laptops (HDD)				
	Desktop Computers, prof. IT (HDD)				
	BEV, (P)HEV (electro engine)	ELV			
Printed Circuit Board	Desktop computers, prof. IT	WEEE	Au, Ag, Bi, Pd, Sb	Entire devices w/o battery (mobile phones), PCBs (shredded, unshredded), CuPM granulate	Yes
	Laptops				
	Mobile phones				
	Tablets				
	External CDDs, ODDs, devices with internal CDDs/ODDs				
Li-ion batteries	Laptops	WEEE	Co	Batteries	Yes
	Mobile phones				
	Tablets				
	Li-ion batteries in other WEEE				
	BEV, (P)HEV	ELV			
NiMH battery	NiMH batteries in WEEE	WEEE	Co, Ce, La, Nd, Pr	Batteries	Yes (Co) / No (REEs)
	HEV	ELV			
Lead acid batteries	Lead-acid batteries	WEEE	Sb	Batteries	Yes
		ELV			

*Recent developments in countries outside the EU have been reported but detailed information about the economic feasibility is not yet available.

CEWASTE Scope



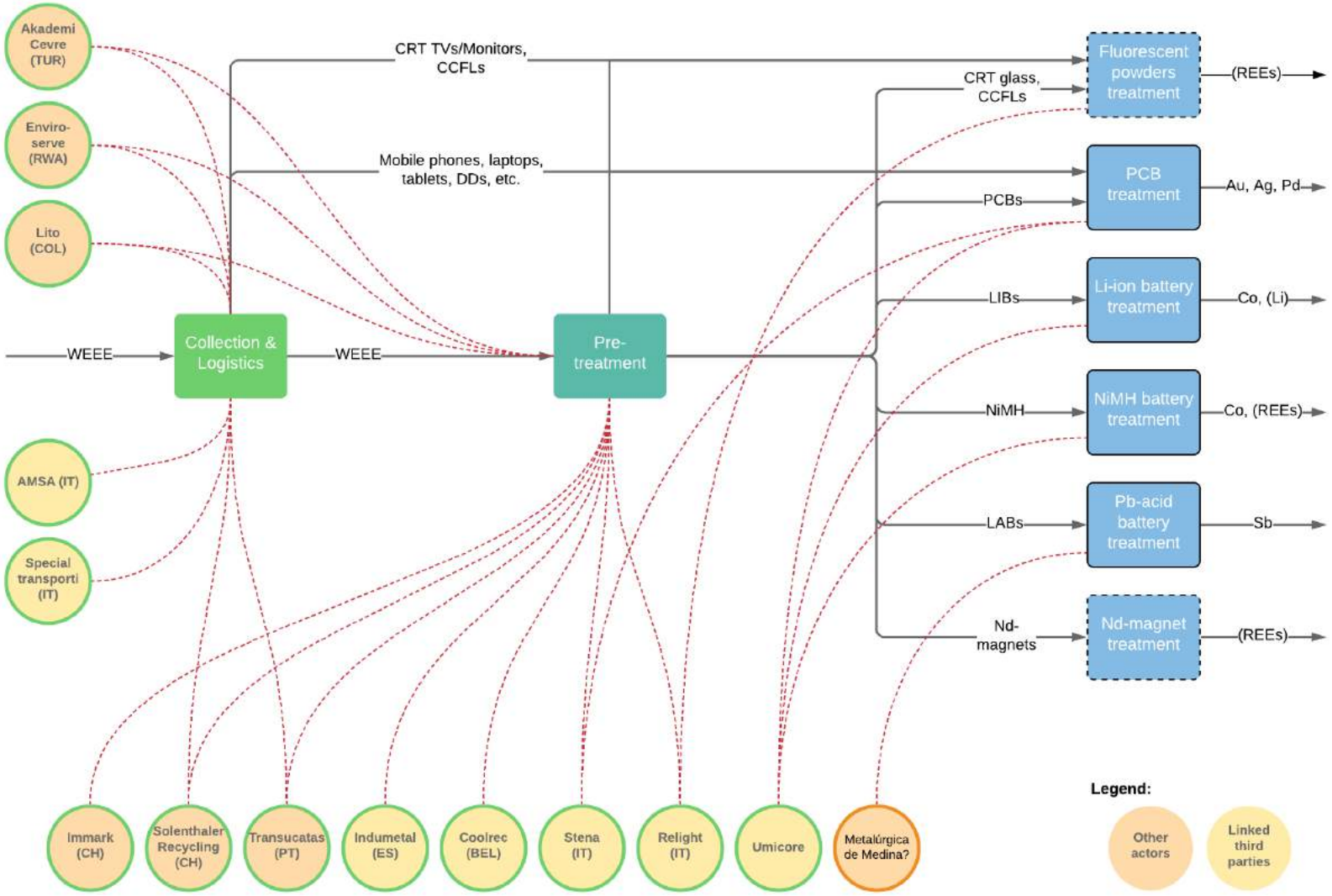
CEWASTE Pilot audits

Goals of CEWASTE pilot audits

The **goals** of the pilot audits are to:

- Test the **real-world feasibility** of the CEWASTE requirements
- Carry out a **gap assessment** for the audited facilities to meet the CEWASTE requirements in various contexts (EU, non-EU)
- Evaluate the **efforts needed to reach compliance**
- Collect **feedback** from the auditors and auditees regarding the applicability of both the **CEWASTE requirements** and **assurance documents** such as manuals and checklists
- Collect data/feedbacks/suggestions on the **long-term sustainability** of the CEWASTE scheme

Scope of CEWASTE pilot audits



>20 audits planned, across 8 countries

Organisation of CEWASTE pilot audits

- Each pilot audit lead by an **internal auditor** (CEWASTE project member), in charge of planning, coordinating and conducting CEWASTE audits
- In addition, **external auditors** were selected to support the pilot audits
- Shared folder (Dropbox) containing:
  - Administrative documents (Expenses claim form, **auditor contract***, etc.)
  - Planning file (please fill in your availabilities/preferences, **only 1 slot** each!)
  - Audit documents (requirements, checklist, etc.)
  - Training webinar presentations

*Please return signed contract by **31st March** 2020 (per mail, to esther.thiebaud@sofiesgroup.com)

CEWASTE Pilot audits Do's & Don'ts

Do's:

- Bring and wear PPE: sturdy shoes, glasses, helmet, earplugs and safety vest
- Try to keep the lunch break short
- Only check for documents provided by the operator

Don'ts:

- Take pictures, unless explicitly authorized by lead auditor
- Walk alone around the facility
- Inquire about non-relevant and potentially sensitive information (e.g. market prices)
- Accept money or gifts

Source picture: Pixabay License

Management Requirements

4.1 -4.10

Source Picture: Pixabay License

Content

A management system is necessary to prove compliance with all CEWASTE requirements (4.1 & 4.2)

4.1 Management principles

- Legal requirements and identification and review of compliance
- Risk assessment and mitigation
- Competency development and continuous improvement
- Establishment of a documented 6 to 12-month **management, monitoring and evaluation plan** to support continuous improvement, including the scope of the activities which includes short-term, mid-term actions, key performance indicators and targets (example of MM&E plan provided in Annex II of CEWASTE V6)

4.2 Compliance with legal requirements

- Obligation to comply with all applicable legislation and others potential facultative requirements taken into consideration by the operator
- Obligation to maintain records documenting compliance with activities defined in the scope

Source picture: Creative Common C0

Thanks to the management system the operator keeps the overview over the requirements along the entire supply chain (4.3)

4.3 Management System

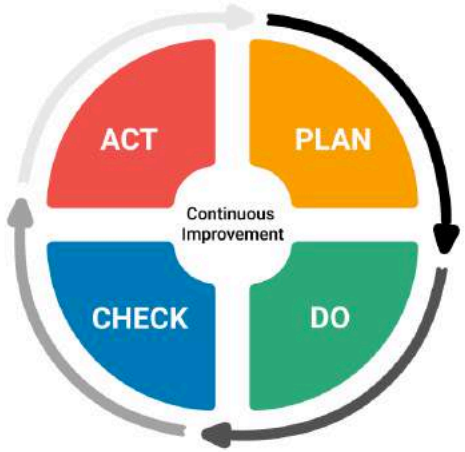
Management System shall:

- Cover all the activities in the value chain
- Define which facilities, sites or mobile facilities are included in the scope
- Define and document the activities and waste streams that are relevant for the recycling of CRM
- Specify responsibility, authority and interrelationship of all personnel involved
- Identify management positions that have overall responsibility for the waste processing, for the identification and monitoring of legal requirements
- Set key objectives and KPIs
- Define review cycles to track the progress of the objectives and KPIs

Checklist examples : Management system (4.3)

Is there a documented 6-12 months plan established to support continuous improvement?

- Includes short-term and mid-term actions?
- Includes key performance indicators and targets?
- How is progress monitored? Frequency, documentation, etc.



Checklist examples : Compliance with legal requirements (4.2)

Does the management system of the operator include a mechanism for identification of environmental health and safety legal requirements and a review of compliance? Is it implemented?

How would you verify that the operator is aware and compliant with relevant national, regional and EU legislation?

- Take a representative sample of legislation/requirements based on your professional judgement and experience and ask how these cases are implemented in daily practice

Checklist examples : Compliance with legal requirements (4.2)

Can the operator show how relevant legislation is identified and compliance monitored ?

- Reviewing the necessary permits and assessing internal processes to ensure legal compliance in the areas of water, soil, environmental protection and occupational safety

- Review and assessment of legal conformity by sector (waste transport, noise control, air emissions control, water pollution control, prevention and management of major accidents, occupational health and safety & radiation protection)

- A relevance assessment of legislation must be performed by the company and regularly updated. You can check the documentation and compare the contents with operational practice

Risks on health and safety for workers and community members, of poor material quality, CRM losses and environmental damages must be identified and mitigated (4.4)

4.4.1 Risk Assessment procedures and activities

- Definition and documentation of risk assessment procedures and activities
- Regular update requirement of the risk assessment, taking into account changes in the operating environment
- Appropriate planning of risk assessments and of an acceptable level of reliability in order to allow continued operations in compliance with the CEWASTE requirements

4.4.2 Quality Risks

- CRM losses due to quality that fails to meet the quality goals of the operator (e.g. CRM content below technical/economic feasibility threshold)
- Addressing potential quality risks and establishing key quality goals for the operations
- Quality goals part of the management, monitoring and evaluation plan

Mitigation plans can prevent the manifestation of risks and teaches workers the proper reaction in case of emergency (4.4)

4.4.3 Health, Safety and Environment (HSE) risks

- Execution of all necessary measures to prevent and mitigate risks posed to the environment and human health
- Mainly due to the presence of hazardous substances released during the handling and pre-treatment of WEEE and waste batteries
- Minimum requirement to develop a fire and explosion prevention plan and emergency plan, including emergency testing and corrective action procedures

4.4.4 Risk Mitigation

- Requires the existence of documented action plans (including timetable, responsibilities and activities) including risk mitigation measures that cover the activities in the scope of the CEWASTE certification

Checklist examples : HSE risks (4.4.3)

Is there documented information how HSE risks are addressed?

Risk examples

- Fire risks
- Accidents
- Exposure to hazardous substances
- Theft

Mitigation strategy examples

- Fire detectors & extinguishers, emergency exits
- Education/information of the workers
- Adequate use of PPE
- Control and maintenance of the infrastructures

Which risks could occur and which measures could operators take to mitigate them?

Checklist examples : Quality risks (4.4.2)

Is there documented information how the quality risks are addressed?

- Examples of quality goals:
  - Minimum CRM-content in selected outputs
  - Maximum content of substances hindering recovery of CRMs in selected outputs
- Check if some of the quality risks are addressed by asking for records and documentation with information on the risks, the quality goals, the defined measures and milestones.

Upstream and downstream activities shall be monitored (4.5.1 & 4.5.2)

4.5.2 Upstream monitoring

- **Origin of all deliveries of WEEE and waste batteries and fractions thereof shall be recorded**

4.5.1 Downstream monitoring

- **Final treatment of CRM containing fractions only possible in facilities that are purposed for CRM recycling and that meet CEWASTE requirements**
- The final treatment concerns the priority CRM or alloys selected for recovery and the corresponding final processing technology
- Maintenance of records of the pre- and final treatment for each waste stream

Pre-treatment and final treatment operators shall keep records, which include the input of each waste stream and the output fractions containing CRM (4.5.1)

Records shall include:

Data on the mass or units of the input CRM components or CRM equipment	Data on the output of CRM components or fractions from each waste stream	rates of output divided by input
Information on the first sender of the materials and the downstream acceptor(s) of the fractions	The treatment technology(ies) applied in the next pre-treatment or final treatment step	

Checklist question examples: Upstream and downstream monitoring (4.5.1 & 4.5.2)

Does the treatment operator record the origin of each consignment of WEEE and waste batteries accepted at the treatment facility?

Does the operator maintain records from the input and the output fractions resulting from the treatment process?

For any downstream treatment of WEEE and fractions does the operator record the receiver of the waste and the performed treatments of the next stage in the value chain?

Traceability requirements guarantee the origin of the waste streams and demonstrate the compliance with CEWASTE (4.6)

Only for lead-acid batteries (LABs)and printed circuit boards(PCBs) waste streams

Objectives:

- Guarantee the **(ultimate) origin** of waste streams and recovered CRMs
- Demonstrate that **LABs** and **PCBs** were treated, and CRM thereof recovered, in compliance with CEWASTE requirements along the **whole supply chain**

For fluent communication and cooperation:

- Seeking to reach a documented agreement between operators concerned regarding the implementation of the CEWASTE requirements throughout the supply chain

The implementation of second party verification processes delivers a credible claim of compliance (4.6)

Only for lead-acid batteries and printed circuit boards waste streams

4.6.1 Due Diligence:

- For internal communication purpose along the value chain
- Implemented to issue a credible of-product claim of compliance associated with the recovered CRM fractions
- Implemented to demonstrate that waste batteries and PCB were treated in compliance with the CEWASTE requirements.

4.6.1.1 Policy and procedures

- Due diligence policy and procedures developed, as well as implemented throughout the CRM recycling chain, to ensure the accuracy and verifiability of records of entering and leaving waste streams, materials at facilities, documentation and claims
- Prevention of the mixing of consignments of waste lead-acid batteries, printed circuit boards or their fractions from demonstrated origin and compliant with the CEWASTE requirements, with other consignments of unknown origin

4.6.2.2 Responsibilities

- Appointment of a due diligence manager responsible for the implementation of the due diligence policy
- Training and monitoring of workers involved in the acquisition, processing and delivery of lead-acid batteries and PCB

A due diligence report must include the following important characteristics (4.6)

Only for lead-acid batteries and printed circuit boards waste streams

Name and address of supplier	Unique reference number	Date of receipt of the lead-acid waste batterie or PCB and their date of release/shipment
Origin of batch or consignment	Shipment address	Weight
If available, proof of compliance with the CEWASTE requirements	If available, name and details of the assurance provider concerned with issuing the proof of compliance	Name and address of all supplier(s), contractor(s) and subcontractor(s) involved in the acquisition, processing and delivery of batch material

- **Handled LABs, PCBs and fractions thereof without appropriate documentation shall be considered of unknown and uncontrolled origin and thereof non-compliant with the CEWASTE due diligence requirements.**

CEWASTE adds new documentation requirements to the CENELEC standards (4.7)

New documents required:

- Fire and explosion prevention plan, emergency plan, emergency testing procedures, records of tests performed and any corrective actions or amendments to the plans
- Documents relating the environment, health and safety (EHS) procedures
- Documents relating the environmental performance, reporting incidents with workers and sub-contractors and communicating data on measured occupational health
- Documentation on special work procedures of processes performed for waste batteries, printed circuit boards, CRM containing components or fractions
- Records documenting compliance with legal and regulatory obligations applying to the activities defined in the scope, and with additional applicable CEWASTE requirements which the operator commits to comply with

For collection points:

- Only records concerning compliance, health, training, and an annual report on collection quantity required

Various actors along the supply chain and specific WEEE require different documentations (4.7)

4.7.2 Pre-treatment and final treatment

- Reports from sub-contractors and sub-processors indicating the reception of the waste batteries, printed circuit boards, CRM or fractions
- Up-to-date organizational chart with all management and production personnel levels, including those positions regarding acceptance and treatment of WEEE and or fractions thereof
- Document in which the actual insurance coverage is stated
- Annual records of mass input for each stream, CRM components and outputs containing CRM removed from the input waste

4.7.3 Fluorescent powders

- Labelling of all mercury presence in lamps following the European Waste Catalogue (EWC) - Commission Decision 2000/532/EC with the code 19 12 11*
- Labelling and indication of non-hazardous material streams resulting from the hydrometallurgical process containing recoverable CRM such as Yttrium and Europium
- The hazardous waste streams of the hydrometallurgical treatment are corrosive and need to be classified and labelled with a pictogram according to the European Waste Catalogue
- For transboundary movements use of the Basel Convention code instead of the EWC

Various actors along the supply chain and specific WEEE require different documentations (4.7)

4.7.4 Lead-acid and lithium-ion batteries

- Labelling of waste lead-acid batteries following the EWC - Commission Decision 2000/532/EC - with the code 20 01 33*
- Use of the Basel Convention code instead of EWC for transboundary movements
- For non-European countries with waste codes less detailed than these of the European Waste Catalogue (EWC), the EWC are used as a source

The identification of key stakeholders is essential for a fluent communication and for the prevention of potential future conflicts (4.8)

4.8.1 Stakeholder communication

- Identification of key stakeholders along the supply chain
- Ensuring fluent communication with them to prevent, anticipate or resolve conflicts or grievance
- Implementation of grievance mechanisms

Supply chain operators (upstream or downstream)

General public

Workers

Local Communities

Authorities

Can you name the relevant stakeholders?

For each stakeholder specific topics have to be communicated in order to raise the awareness of the actors (4.8)

Supply chain operators (upstream or downstream)

Shall be communicated:

- Grievance mechanisms
- Criteria for the sorting of key CRM equipment
- Awareness raising of potential challenges or pollution issues caused by a lack of capacity during previous treatment steps

May be communicated (among others):

- Data erasure practices
- Advantages of CEWASTE requirements
- Advantages and business cases of complying with the CEWASTE requirements
- Improvement of supply security, management and efficiency through recycling

Workers

Shall be communicated:

- Grievance mechanisms, if not covered by the national regulation
- Awareness raising of potential challenges or pollution issues caused by a lack of required technical set-up and/or operational skills
- Practical approaches on how to implement the CEWASTE requirements
- Possible difficulties when switching practices to implement CEWASTE requirements

May be communicated:

- Advantages of CEWASTE
- How to reduce health risks
- Environmental and health risks associated with unsafe recycling practices

For each stakeholder specific topics have to be communicated in order to raise the awareness of the actors (4.8)

Local Communities

Shall be communicated:

- Grievance mechanisms
- Environmental and health risks associated with the processing activities at the facilities

May be communicated:

- Advantages of applying CEWASTE requirements, including the well-being of local communities and the avoidance of environmental risks

Authorities

Shall be communicated:

- Report of legal compliance

General public

Shall be communicated:

- Following of data erasure measures
- Visual materials to raise awareness on the relevance of collecting WEEE and waste batteries containing CRM

Checklist question examples: Stakeholder communication (4.8)

Is a grievance mechanism established and easily accessible for workers, local communities and other stakeholders?

Is there information available on how to file a grievance, on how it is being handled, on the length of response time, on how the results are communicated and on how to file an appeal?

Is there documented information about the stakeholder mapping exercise?

Is information made available to local communities communicating the environmental performances (e.g. emissions, environmental savings) of treatment facilities?

Personnel management is necessary to ensure workers possess the right competences and have access to proper training, especially concerning their health and safety (4.9)

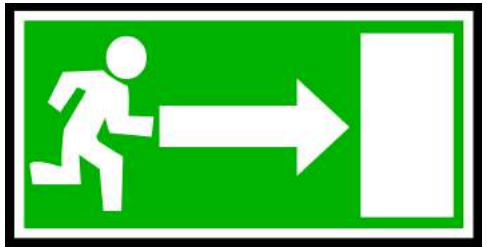
4.9.1 Competences

- Identification of training needs
- Organisation of training programs to enhance the skills of the workers and improve the collection and treatment process of WEEE and waste batteries containing CRM
- Organisation of trainings for the CEWASTE requirements and other legal requirements
- Definition of the necessary personnel competences for each function

4.9.1.1 CRM related training

- Ensure the adequate training for each workers covering the following aspects:
  - Key types of WEEE containing CRM
  - Importance of separate collection of WEEE containing CRM
  - Sorting criteria for key WEEE containing CRM
  - Data erasure procedures used by the facility to remove personal data
  - Proper shipping
  - Technical requirements for the pre- and final treatment
- Availability of training materials covering these topics

A healthy and safe working environment must be ensured by the operator of the facilities (4.9.2)



4.9.2 Occupational health and safety

- Access at no cost for workers potentially exposed to deleterious substances to:
  - Personal protection equipment
  - First aid equipment
  - Sanitary and eating spaces
- Implementation of special measures addressing issues in relation to women's health (e.g. pregnancy or maternity)
- Clearly marked emergency exits, escape routes, firefighting equipment and fire alarms for every indoor workplace
- Emergency exits clear of obstacles and known by all workers

A healthy and safe working environment must be ensured by the operator of the facilities (4.9.2)

4.9.2.1 Occupational health requirements for **pre-treatment and final treatment**

- Regular health monitoring of workers shall be undertaken (e.g. once a year or as specified by national legislation)
- Assessment of workers' occupational exposure to toxics
- Risk assessment of toxic exposure to ensure the respect of the PEL values
- Proper work wear provided
- Access to showers and hand cleaning facilities
- Regular information and training on health risks provided to workers
- Suitable personnel protection equipment provided and used by the workers

Special OHS requirements for final treatment (4.9.2)

Lead-acid waste batteries: - Access to a segregated eating area with air conditioning - Access to ventilated masks to all workers - Monitoring and testing of employees lead exposure and blood lead level - Minimum test intervals depending on the working position (e.g. workers at furnace or off-gas treatment every 3 months or office worker every 12 months	Lithium-ion waste batteries: - Regular control of indoor air quality (levels of hydrogen fluoride and volatile organic compounds) -> every three months - Obligation to use protective work wear and gear for workers handling lithium-ion batteries
Fluorescent powders: - Access to a segregated eating area with air conditioning - At least annual health check for employees and contractors with potential risk exposure to deleterious elements beyond the exposure limits - Health test including urine sample for cadmium, ALA-d and beta 2 macroglobulin - Special personnel protection equipment for employees and contractors exposed to hydrometallurgical treatment of CRM	Magnets: - Measurements of Nd and Nd oxide in the air at the final treatment - Medical check of the staff before and after the treatment

Checklist question examples: 4.9 Personnel Management

Does the operator provide suitable training programmes and materials to personnel on all the CEWASTE requirements and their application to the activities of the operator?

How would you verify the existence of suitable training programs and materials?

- Training programmes should be designed in a way that is suitable to the personnel, in terms of content and approach.
- There have to be records that personnel/contractors involved in operations are instructed and trained to properly implement the CEWASTE requirements. There should be training material about the types of waste containing CRM

Checklist question examples: 4.9 Personnel Management

Is there a written analysis of how the CEWASTE requirements affect personnel's competence development? Is the effectiveness of competence development evaluated?

What is the purpose of the personnel competency assessment and trainings?

- The processes for training and further capacity development in the field of environment and health serve to improve the professional competence of the workforce; they are to be largely standardised and also implemented by the operator
- The auditor shall check whether the training meets the requirements set by the operator and the process relevant requirements and also addresses how to operate in case of emergency
- The persons/groups who have completed appropriate training shall be detailed in a protocol or in a separate list
- The auditor checks whether training materials, technical guidance documents, safety information, Information graphics, examples of WEEE components dealt with at the workplace are available

Sustainability requirements focus on local communities' well-being, environmental protection and contribution to society (4.10)

4.10.1 Local communities' well-being

- Operating facilities contributing to the well-being of local communities
- Social management system applied to address environmental and social risks and improve the contribution to sustainable development

4.10.2 Environmental impact control

- Understanding of the environmental impact of the operating activities
- Application of an environmental management plan with performance indicators including at least:
  - The monitoring of pollutants as established in the national regulations
  - The chemical contamination of surface- or groundwater and soil as well as air quality
  - The process effluents and wastewater characteristics (COD, POPs, high salt content, heavy metals, F, P)
  - The emissions to air and soil quality near treatment facilities
- Measures to prevent and mitigate all forms of pollution (special measurements for fluorescent powder treatments, waste batterie treatments and magnet treatments)
- Assessment of the efficacy of the measures

Emission to air, soil and water shall be measured, restricted, monitored and controlled for the following specific WEEE treatments (4.10)

4.10.2.1 Fluorescent powder treatment

Measures to be taken by the operator for hazardous waste and non-hazardous waste related to the hydrometallurgical treatment:

- A procedure for the handling of waste packaging material
- A procedure for the safe handling and final disposal of all waste that cannot be recycled or recovered
- For third party transfers, requirement to own a official permit for the facilities from the authorities and the prove of compliance of the treatment operator, if such facility is located in a non-OECD country
- Documenting the conformity of the third parties accepting the waste making available the required permits from the relevant authorities
- The provision of weight notes for each consignment of output waste dispatched and an electronic or written registration system to record the destination and weight(s) of each output waste consignment

Limitation of concentration in final effluent discharges:

- Pb ≤ 0,5mg/l
- Cd ≤ 0,1 mg/l
- Zn ≤ 1.0 mg/l
- Hg ≤ 0,02 mg/l
- pH 6,5-10

Emission to air, soil and water shall be measured, restricted, monitored and controlled for the following specific WEEE treatments (4.10)

4.10.2.2 Waste batterie treatment

Lead-acid batteries

- Effective measures in place to keep all working environments and the surrounding areas free from acid and acid mist and lead containing fume and dust
- Measurement, restriction, monitoring and control of emissions to air and discharges to soil and water
- Application of respective national or regional emission standards
- If no suitable or applicable national standards are available :
  - Application of appropriate international and EU standards contained in the International Lead and Zinc Study Group (ILZSG) Study on Environmental and Health Controls on Lead listed in Table V.1 of Annex V

Lithium-ion treatment and batteries

- Prevention of releases of harmful gases by installing a ventilation system and filters
- Limits for airborne emissions are (in case no national legislation is applied):
  - Dust ≤ 5mg/Nm^3
  - TOC < 18mg/Nm^3
  - Dioxins < 0,1 ng TEQ/Nm^3
  - SO2< 200mg/Nm^3
  - NOx < 260mg/Nm^3
  - CO < 100mg/Nm^3

4.10.2.3 Magnets treatment

- Prevention of releases to ozone-depletion substances during removal of NdFeB-magnets from refrigerators e.g.

Checklist question examples: 4.10 Sustainability Requirements

Are there procedures for restricting, monitoring and controlling emissions to air and discharges to soil and water? (Particular attention should be given to acid (mist) and fumes/dust containing lead)

- The operator of the plant should document, which national or regional emission standards to apply
- If no suitable emission standards exist, the operator should document which limit value from the "Study on Environmental and Health Controls on Lead" from the International Lead and Zinc Group the operation complies with
- In both cases the actual emission values shall be documented and made available for the auditor
- For further revisions of the standard, the auditor shall document, which limit values have to be complied with

Does the operator monitor limit values in process effluents (which may contain pollutants from the activities)?

- The auditor shall verify any existing emission declarations for their content and validity
- The auditor shall check the last measurement report and the feedback from the local/national enforcement agency
- The auditor shall examine whether the local/national enforcement agency has taken organisational or technical measures to remedy the situation and whether a timely implementation has been made or has been planned

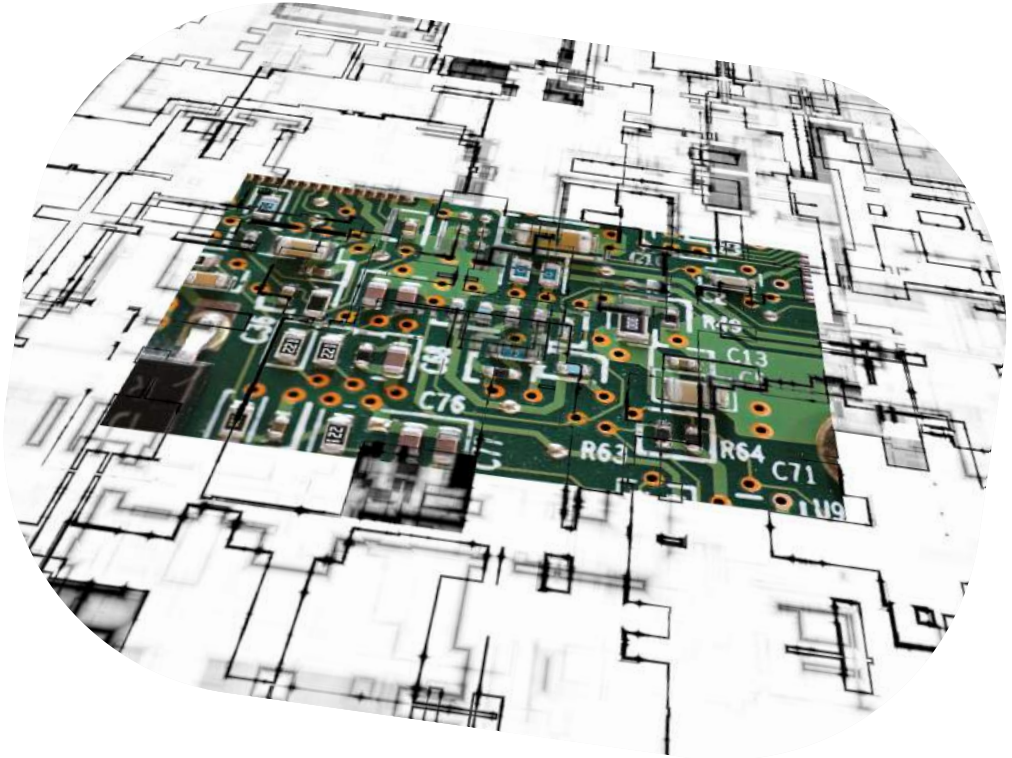
Next steps

Next steps

- Next training webinars:
  - **24.03.2020,** from 9 am to 12 pm CET: **CEWASTE Training II** - technical requirements
  - **03.04.2020,** from 1 pm to 5 pm CET: **EN 50625 Training I** - Introduction, administrative & organizational requirements
  - **07.04.2020**, from 1 pm to 5 pm CET: **EN 50625 Training II** - Collection & logistics, technical requirements
- **External auditors**: please register for webinars + read and sign the auditor contract
- We will inform you on decisions made regarding the CEWASTE pilot auditing timeline

Thank you for your attention!

And please provide your feedback:
https://forms.gle/9qgBow8dvrXefKLd7



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ANNEX B: WEBINAR ON CEWASTE TECHNICAL REQUIREMENTS

CEWASTE

Audit training Webinar

Technical requirements

Esther Thiébaud, Arthur Haarman, Laura Beyeler

Sofies

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leading sustainability

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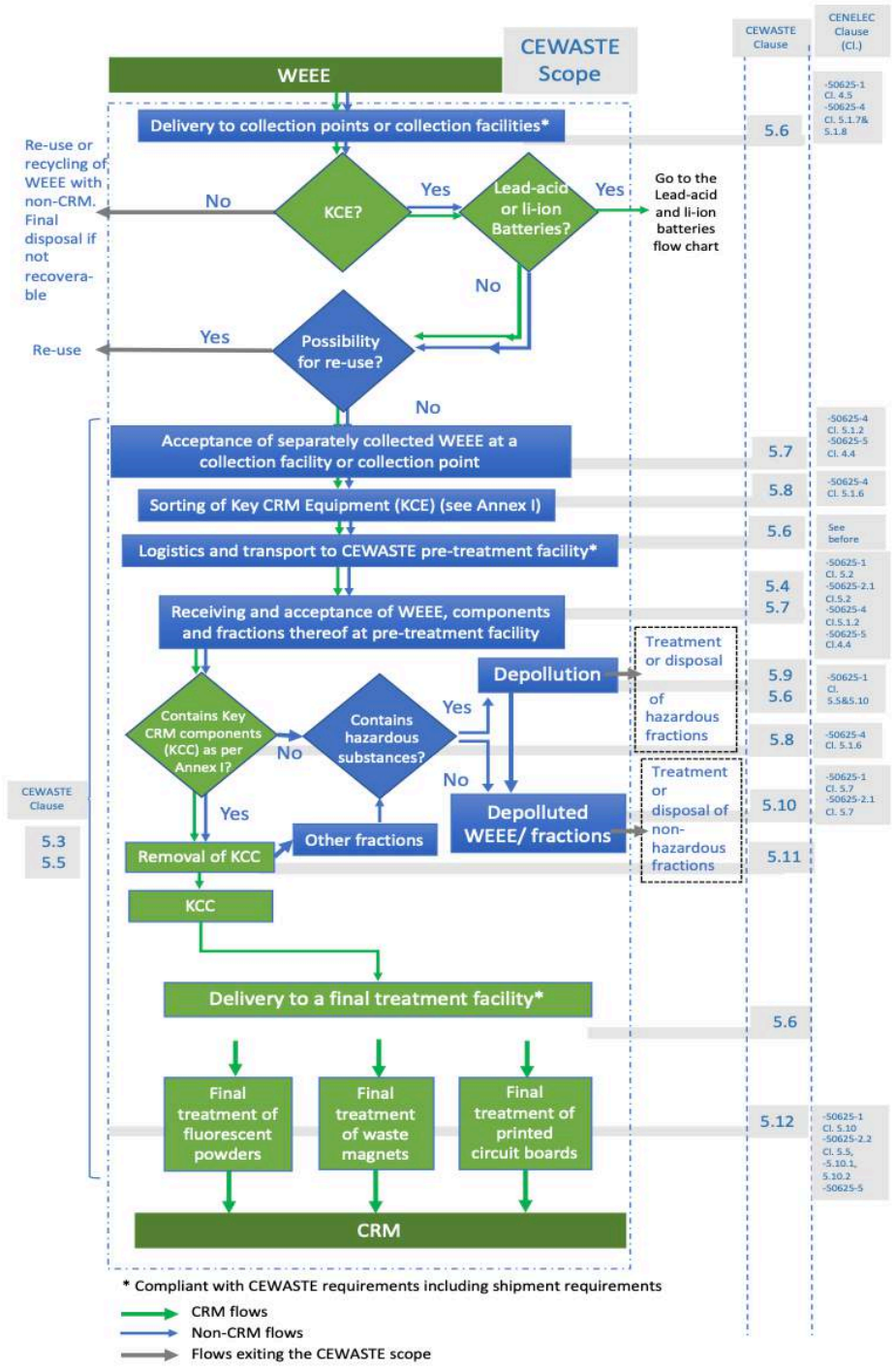
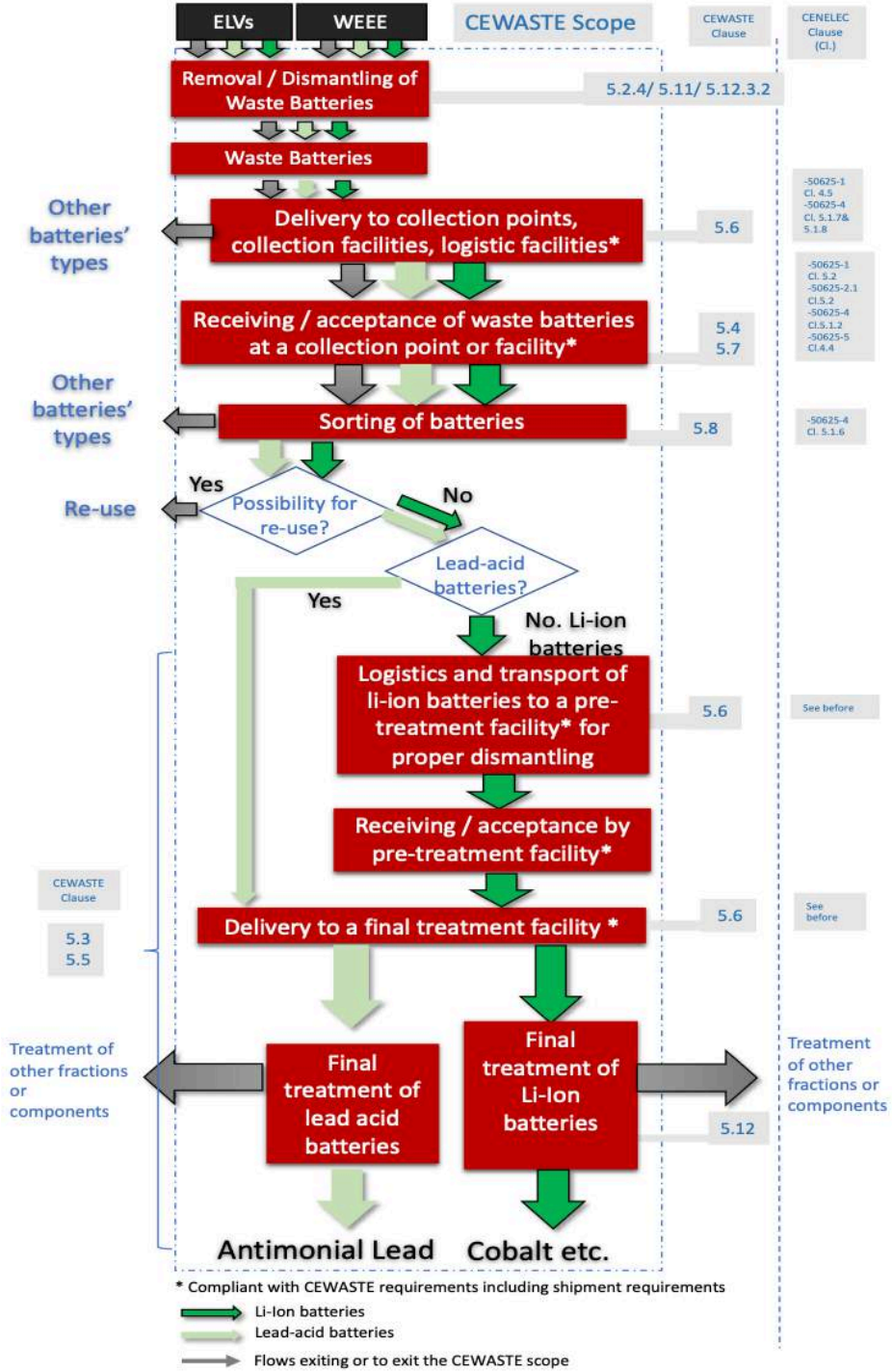
  - Storage at collection and treatment facilities 5.5
  - Shipping 5.6
  - Acceptance by collection and logistics operators 5.7
  - Sorting 5.8
  - De-pollution at treatment facilities 5.9
  - Treatment of non-depolluted WEEE and fractions 5.10
  - Removal of CRM-containing components 5.11
  - Final treatment for recovering CRM fractions and disposal of waste fractions 5.12

Comparison: Structure of EN 50625-1

• General	5.1
• Receiving of WEEE at treatment facility	5.2
• Handling of WEEE	5.3
• Storage of WEEEE prior to treatment	5.4
• Depollution	5.5/5.6
• Treatment of non de-polluted WEEEE and fractions	5.7
• Storage of fractions	5.8
• Recycling and recovery targets	5.9
• Recovery and disposal for fractions	5.10
• Technical and infrastructural pre-conditions	4.2


WEEE
CEWASTE Scope
CEWASTE Clause
CENELEC Clause (Cl.)
Delivery to collection points or collection facilities*
5.6
Re-use or recycling of WEEE with non-CRM. Final disposal if not recovera-ble
No
KCE?
Yes
Lead-acid or li-ion Batteries?
Yes
Go to the Lead-acid and li-ion batteries flow chart
No
Re-use
Yes
Possibility for re-use?
No
Acceptance of separately collected WEEE at a collection facility or collection point
5.7
Sorting of Key CRM Equipment (KCE) (see Annex I)
5.8
Logistics and transport to CEWASTE pre-treatment facility*
5.6
Receiving and acceptance of WEEE, components and fractions thereof at pre-treatment facility
5.4 5.7
Depollution
Treatment or disposal of hazardous fractions
5.9 5.6
Contains Key CRM components (KCC) as per Annex I?
No
Contains hazardous substances?
Yes
5.8
No
Depolluted WEEE/ fractions
Treatment or disposal of non-hazardous fractions
5.10
Yes
Other fractions
5.11
Removal of KCC
KCC
Delivery to a final treatment facility*
5.6
Final treatment of fluorescent powders
Final treatment of waste magnets
Final treatment of printed circuit boards
5.12
CRM
CEWASTE Clause
5.3 5.5
* Compliant with CEWASTE requirements including shipment requirements
CRM flows
Non-CRM flows
Flows exiting the CEWASTE scope


ELVs
WEEE
CEWASTE Scope
CEWASTE Clause
CENELEC Clause (Cl.)
Removal / Dismantling of Waste Batteries
5.2.4/ 5.11/ 5.12.3.2
Waste Batteries
Other batteries' types
Delivery to collection points, collection facilities, logistic facilities*
5.6
Receiving / acceptance of waste batteries at a collection point or facility*
5.4 5.7
Other batteries' types
Sorting of batteries
5.8
Re-use
Yes
Possibility for re-use?
No
Lead-acid batteries?
Yes
No. Li-ion batteries
Logistics and transport of li-ion batteries to a pre-treatment facility* for proper dismantling
5.6
Receiving / acceptance by pre-treatment facility*
CEWASTE Clause
5.3 5.5
Delivery to a final treatment facility *
5.6
Treatment of other fractions or components
Final treatment of lead acid batteries
Final treatment of Li-Ion batteries
5.12
Treatment of other fractions or components
Antimonial Lead
Cobalt etc.
* Compliant with CEWASTE requirements including shipment requirements
Li-Ion batteries
Lead-acid batteries
Flows exiting or to exit the CEWASTE scope

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  - Sorting 5.8
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  - Treatment of non-depolluted WEEE and fractions 5.10
  - Removal of CRM-containing components 5.11
  - Final treatment for recovering CRM fractions and disposal of waste fractions 5.12

WEEE entering different types of collection points shall be sorted into specific streams (5.1.1.1)

5.1.1.1 WEEE collected in streams:

- Fluorescent lamps (containing fluorescent powders)
- CRT monitors and TVs (containing fluorescent powders)
- Temperature exchange equipment (TEE) (containing magnets)
- Household appliances other than TEE (motors/drives containing magnets)
- Laptops (hard disk drive - HDD), desktop computers (HDD), mobile phones, tablets and similar devices containing printed circuit boards and magnets
- External CDDs, ODDs, devices with internal CDDs/ODDs
- Electro engines from electric vehicle (BEV) and (plug-in) hybrid electric vehicle (P)HEV
- Batteries from electric vehicle (BEV) and (plug-in) hybrid electric vehicle (P)HEV
- Lithium-ion batteries
- Lead-acid batteries

Source Comp.	Key CRM Equipment	Waste Type	CRMs	Required/Viable Input for End-processing	Current Economic Feasibility	
Fluorescent powders	Fluorescent lamps	WEEE	Eu, Tb, Y, Ce, La	Fluorescent powder	No*	
	CRT monitors and TVs		Y, Tb, Eu, Gd,La, Ce	Fluorescent powder		
Nd-magnets	Temperature exchange equipment (engine, compressor)	WEEE	Nd (+ Dy, Gd, Pr, Tb)	Magnets	No	
	Household appliances other than temperature exchange equipment (motors/drives)					
	Laptops (HDD)					
	Desktop Computers, prof. IT (HDD)					
	BEV, (P)HEV (electro engine)	ELV				
Printed Circuit Board	Desktop computers, prof. IT	WEEE	Au, Ag, Bi, Pd, Sb	Entire devices w/o battery (mobile phones), PCBs (shredded, unshredded), CuPM granulate	Yes	
	Laptops					
	Mobile phones					
	Tablets					
	External CDDs, ODDs, devices with internal CDDs/ODDs					
Li-ion batteries	Laptops	WEEE	Co	Batteries	Yes	
	Mobile phones					
	Tablets					
	Li-ion batteries in other WEEE					
	BEV, (P)HEV	ELV				
NiMH battery	NiMH batteries in WEEE	WEEE	Co, Ce, La, Nd, Pr	Batteries	Yes (Co)	No (REEs)
	HEV	ELV				
Lead acid batteries	Lead-acid batteries	WEEE	Sb	Batteries	Yes	
		ELV				

*Recent developments in countries outside the EU have been reported but detailed information about the economic feasibility is not yet available.

Collection points are only responsible for collection, further treatment is prohibited without a permit (5.1.1.2)

- Operators of collection points:
  - Ensure the compliance with the technical requirements of TS 50625-4
  - Ensure the separate storage of received loose batteries from notebooks, mobile phones and tablets for further treatment
  - Are prohibited to carry out any form of pre-treatment or preparation of re-use without a valid permit

The collection of waste batteries typically has five collection routes (5.1.1.3)

Any form of waste batteries

Collection points for portable batteries

- Separate collection without differentiation of battery chemistries
- Located at supermarkets or public places
- Transportation in suitable containers to sorting/treatment operator

Collection points and facilities for WEEE

- Mostly collected together with WEEE in which they are embedded
- Collection at public collection points, collection facilities, retailers or repair shops
- Transportation in suitable containers to treatment operator

Collection of batteries from end-of-life vehicles

- Lithium-ion batteries to be removed only by trained personnel and transported as dangerous goods to dismantling operator
- Prevention of damages to the batterie in the removal process

Take-back schemes for industrial batteries

- Only concerns lithium-ion batteries contained in e-bikes and e-scooters

Collection of (semi)-industrial waste batteries

- Separate collection at the company site
- Brought to collection facilities

Checklist examples: General technical requirements (5.1)

5.1.1.1

Are WEEE received at collection points, collection facilities and logistics facilities sorted into streams of key CRM equipment according to in Annex I of the CEWASTE Standard?

For which waste streams containing CRM are there separate collection bins? How are they collected separately?

- Lamps containing fluorescent powders
- CRT displays containing fluorescent powders
- Desktops, laptops, mobile phones, tablets, devices containing external CDD and ODD and similar equipment containing printed circuit boards
- Lead-acid waste batteries
- Lithium-ion waste batteries and NiMH waste batteries
- Household appliances other than TEE (motors/drives) and - Temperature exchange equipment (TEE) (engine, compressor)

5.1.2.3

Through which routes does the operator collect waste batteries?

Does the operator document the different collection routes? Which ones do apply?

- Collection points for portable batteries
- Collections points and facilities for WEEE
- Collection of batteries from end-of-life vehicles
- Take-back schemes for industrial batterie
- Collection of (semi)industrial waste batteries

Source Picture: Ecosystem, 2020

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  - Final treatment for recovering CRM fractions and disposal of waste fractions 5.12

The new technical and infrastructure pre-conditions concern fluorescent powders and waste batteries treatment operators (5.2)

5.2.3 Requirement for the application of hydrometallurgical processing for fluorescent powders treatment:

- **Storing of sulphuric acid** in appropriate containers, in a cool, dry area away from direct sunlight and heat source
- **Prohibition to store sulphuric acid indoors** in large quantities (potentially dangerous accumulation of vapours)
- **Appropriate labelling** of stored sulphuric acid
- Existence of a **centralized aspiration** consisting of cartridge filters for fluorescent powders and a scrubber unit for acid vapours
- Existence of an **automatic remote blocking system** to stop the process in case of emergency

5.2.4 Requirement for waste batterie treatment operators:

- Obligation to situate waste lead-acid and lithium-ion battery recycling plants in **designated industrial zones**, not adjacent to residential areas or rural populations
- **Removal of batteries** only taking place in **separate spaces** equipped with fire protection devices, ventilation and an alarm system
- Site of treatment for lead-acid and lithium-ion batteries equipped with **impermeable surfaces** and **waterproof covering** for appropriate areas, with provision of **spillage collection** facilities and decanters
- Lithium-ion batteries treatment equipped with
  - Appropriate collection **containers** for disassembled parts
  - Equipment for the **treatment of water** in compliance with health and environmental regulations determined by the competent licensing authority of the plant
- Design of battery storage facilities in a way to **avoid potential discharges of acid** into soil, ground or surface water sources

Checklist examples: Technical and infrastructural preconditions, fluorescent powders lamps (5.2)

5.2.3

Is sulfuric acid from hydrometallurgical processing of fluorescent powders appropriately stored in labeled containers?

What is an appropriate storage for fluorescent powders?

- Sulfuric acid shall be stored in a cool, dry area away from direct sunlight and heat sources
- Sulfuric acid should not be stored indoors in large quantities, to prevent the possible accumulation of vapours
- Product containers shall be regularly examined for signs of damages or leaks

5.2.3

Are facilities applying hydrometallurgical processing for the treatment of fluorescent powders equipped with a centralized aspiration and a remote blocking system?

Visual inspection at the plant
How do these systems work?

- Facilities shall have a centralized aspiration consisting of cartridge filters for fluorescent powders and a scrubber unit for acid vapours
- Facilities shall count with an automatic remote blocking system (to stop the process in case of an emergency)

Checklist examples: Technical and infrastructural preconditions, batteries (5.2)

5.2.4

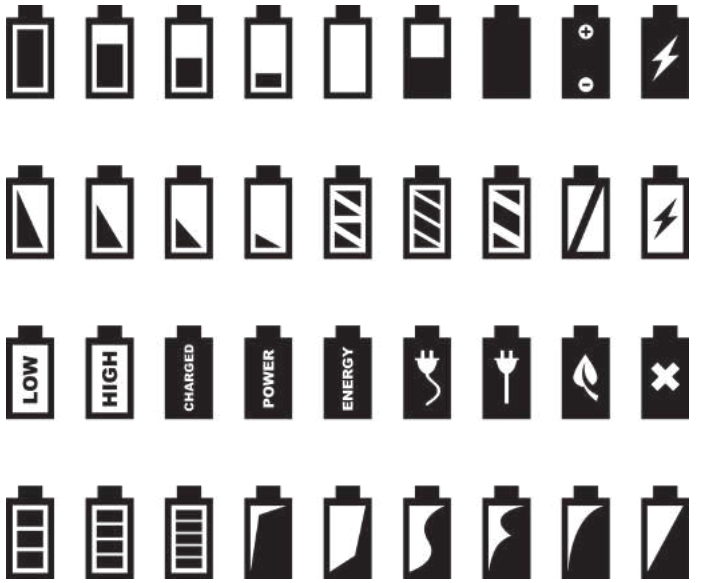
Are battery storage facilities designed in a way that potential discharges of acid cannot contaminate soil, ground or surface water sources?

Does the battery removal at the treatment facility take place in a separate space equipped with fire protection devices, ventilation and an alarm system?

Is the waste battery treatment facility equipped with impermeable surfaces, waterproof covering, spillage collection facilities including where appropriate, decanters or containers for spare parts of disassembled lithium-ion batteries?

Is the waste battery treatment facility situated in a designated industrial zone and separated from residential areas or rural populations?

Even if recycling plants are situated in designated industrial zones, there might still be people living close by. Therefore, the surrounding of the plant shall be checked for obvious violations



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  - Final treatment for recovering CRM fractions and disposal of waste fractions 5.12

Typically three types of lithium-ion batteries arrive at the treatment facilities: undamaged, partially undamaged or damaged (5.4.2)

Types of batteries arriving at treatment facilities:

1) Complete and undamaged batteries (whole batterie undamaged) — Non-critical
2) Complete case with inner short-cut from transportation — Critical
3) Case or battery damaged with potential leakage of electrolyte — Critical

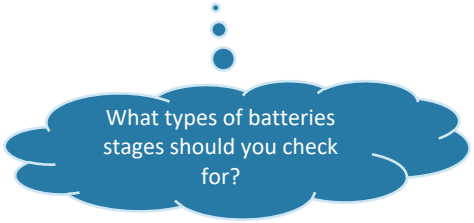
- Damaged batteries to be separated from batteries with complete cases
- Ensuring appropriate safety measures, e.g. storing them in a container with appropriate absorption materials
- Portable type 1 lithium-ion batteries from ELV to be kept separately and labeled based on their chemistry composition

Source Picture: Sofies, 2020

Checklist examples: Receiving of WEEE (5.4)

5.4.2

Does the operator distinguish the different states of lithium-ion waste batteries and are the critical types appropriately handled and stored according to CEWASTE requirement 5.4.2?



- The critical types (2nd and 3rd) shall be distinguished from non-critical (type 1).
- The auditor shall check for appropriate separation of damaged batteries (type 3) from batteries with complete cases (type 2) as well as appropriate safety measures, such as storing them in Pyro-Bubbles or Vermiculite in an appropriate container

5.4.2

Are lithium-ion waste batteries from ELV kept separate and labeled according to their chemistry composition?

- Portable type 1 lithium-ion batteries also from electric vehicles shall be kept separate and labeled based on their chemistry composition
- Typical lithium-ion composition is as follows:
  - The cathode composition of lithium-ion waste batteries from electric vehicles typically include LiFePO4 type battery, LiMnO2 type battery, Li(Ni,Co,Mn)O2 type battery, Li(Ni, Co, Al)O2 type battery, LiCoO2;
  - NCM type lithium-ion waste batteries have different compositions e.g. NCM111, 523, 622, 811 etc.
  - There are also mixed lithium-ion waste batteries e.g. LiMnO2 mixed with NCM, LFP mixed with LMO
  - Concerning the anode compositions most typical ones are graphite based, Li4Ti5O12 based, Silicon-C combined, and Si-O based

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Treatment, logistics, and collection facility operators shall take all necessary measures to ensure the proper and safe storage of WEEE, waste batteries and CRM & fractions (5.5)

5.5 Sound storage of waste batteries

- Open battery contacts taped of
- Loose wires taped to cells/batteries
- Kept in sealed containers with inert materials around them

5.5.1 Sound storage of lead-acid waste batteries

- Separate storage of lead-acid batteries
- Avoidance of uncontrolled draining and leakage of sulfuric acid from lead batteries at storage and in the recycling plants
- Storage of leaking batteries in acid-proof containers compliant with the UN recommendations on the transport of dangerous goods

5.5.1 Sound storage of lithium-ion waste batteries

- Protection of lithium-ion batteries to prevent exposure to temperature close to 100°, to water, and to prevent any crushing or physical damage during handling, sorting, and storage
- Separate storage of lithium-ion waste batteries with different compositions

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Where shipment of WEEE or waste batteries has to be undertaken, operators should ensure compliance of downstream operators with the highest existing regulations (5.6)

Compliance with:

- The WEEE treatment requirements of European Directive 2012/19/EU or equivalent treatment requirements
- The Regulation (EC) No 1013/2006 on shipments of waste
- The Regulation (EC) No 1418/2007 on the export for recovery of certain waste listed in Annex III or IIIA in Regulation (EC) No 1013/2006
- The Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures
- The Directive (EURATOM)2006/117 on the supervision and control of shipments of radioactive waste
- National authorization procedures of the country where the facility is established
- EERA, Technical Guidance Document, Safe Collection and Transport of Electronic Equipment with Lithium Batteries, 2019
- CEWASTE requirements

Source Picture: Pixabay License

5.6 Compliance with the European agreements and regulations shall be ensured for the safe inland and international transport of dangerous fractions by road, rail or inland waterways

Compliance with:

- Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods
- European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways – ADN (2017)
- European Agreement concerning the International Carriage of Dangerous Goods by Road – ADR (2019)

Source Picture: Pixabay License

Additional requirements for the shipment of waste batteries (5.6)

5.6.3.1 Lead-acid waste batteries

- Collection and transportation with its complete acid content
- For the bulk transports of waste lead-acid batteries obligation to fulfill the requirements listed in the Annex V in Table V-2
- Transport of waste lead-acid batteries subject to the European Agreement concerning the International Carriage of Dangerous Goods by Road – 2019
- Criteria for transport:
  - packed and secured so they cannot slip, fall or be damaged
  - provided with carrying devices, unless stacked on pallets
  - free of any dangerous traces of acid on the outside
  - protected against short circuits

5.6.3.2 Lithium-ion waste batteries

- Transport of lithium-ion waste batteries subject to the European Agreement concerning the International Carriage of Dangerous Goods by Road – 2019 as listed in Annex IV, Table IV-1

Source Picture: Pexels License

Checklist examples: Shipping (5.6)

5.6.3.1

Are the collection, transport and shipment of complete lead-acid waste batteries in compliance with the ADR, RID, ADN and Basel Convention guidelines so that the safe international transport of dangerous goods is ensured?

5.6.3.2

Is the transport of lithium-ion waste batteries conducted in compliance with the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)?

How can you verify compliance with the ADR, RID and AND guidelines?

- Availability of documentations reporting ADR, ADN and RID compliance from the transport agency
- Accompanying certificates to be attached in the transport
- ADR directives compliance for packaging and labelling of containers
- The following markings affixed to the drums:
  - Hazard label class 9 or 9a
  - UN 3480

Source Picture: Inobat.ch

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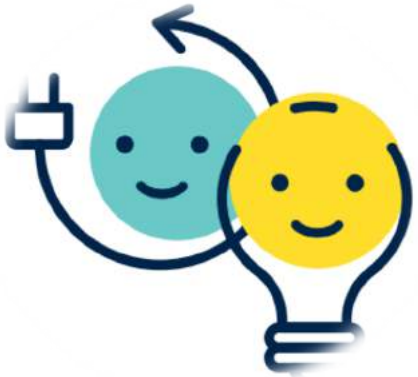
To ensure smooth reception and acceptance of key CRM equipment and raise awareness, collection and logistics facilities shall provide visuals and descriptions that help identifying the types of WEEE containing CRM (5.7)



Source Picture: Ecosystem, 2020

CEWASTE has clear requirements for the acceptance of WEEE containing CRM at collection points, logistics operators and treatment operators (5.7)

5.7.2 Agreement for the acceptance of fluorescent powders and waste batteries

- Delivery of fluorescent powders and waste batteries to a downstream facility only possible with a written agreement issued between the concerned operators
- Development of a procedure allowing verification and compliance with the agreement for the acceptance of materials, which includes the following:
  - Inspection at reception
  - Inspection of each delivery to verify quality and respect of environmental requirements and compliance with the agreement for the acceptance
  - Proof of inspection of transport documents and records of the origin
  - Documentation of the results of the verification

Minimum content of the agreement

Description of materials i.e. type of the waste, physical characteristics, and condition of the WEEE or components	The delivery mode e.g. transport by road, ship or rail
Specification of authorized transports and logistics related requirements	Duration of the agreement
Agreed quantities	Mutually agreed specifications of materials
Packaging requirements	Arrangements for handling of 'off-spec material'
In the case of **printed circuit boards**, arrangements for sampling as set out in 5.3 of TS 50625-5	In case of **waste batteries**, list with containers, which collect the uncontrolled draining and leakage of sulfuric acid or other types of liquid electrolyte from waste batteries
Minimum specifications on possible contaminants such as: Acceptance levels of mercury (Hg); Acceptance levels of fluoride (F); Declaration of check of volatile materials (LiPF6, DMC, EC.); Agreed acceptance levels of beryllium (Be)	

Checklist example: Acceptance (5.7)

5.7

Are there visual information and descriptions provided to public users to identify the types of WEEE containing CRM equipment and instructions on where to dispose of them so that smooth reception of KCEs is ensured?

Check if there is enough and understandable information and instructions (visual and descriptions) available?
Is information for all different KCE available?

5.7

Is there sufficient space available at the collection or logistics facilities to allow separation of WEEE from other waste in relevant containers or areas upon acceptance

The auditor shall observe whether sufficient space is available so that separation of different WEEE from other waste (as well as WEEE suitable for reuse) takes place upon acceptance by collection and logistics facilities.

Check for WEEE that is crushed or stored in an unstable way to save space.

Check for waste stored outside the facilities.

5.7.2

Is there a procedure in place to allow verification and compliance with the agreement for acceptance of materials?

The auditor shall observe if there is a procedure in place to verify compliance with the existing agreement for acceptance of materials. This procedure shall include:

— Inspection at reception;

— Inspection of each delivery to verify quality and respect of environmental requirements and compliance with the agreement for acceptance;

— Proof of inspection of transport documents and record of the origin;

— Documentation of results of the verification.

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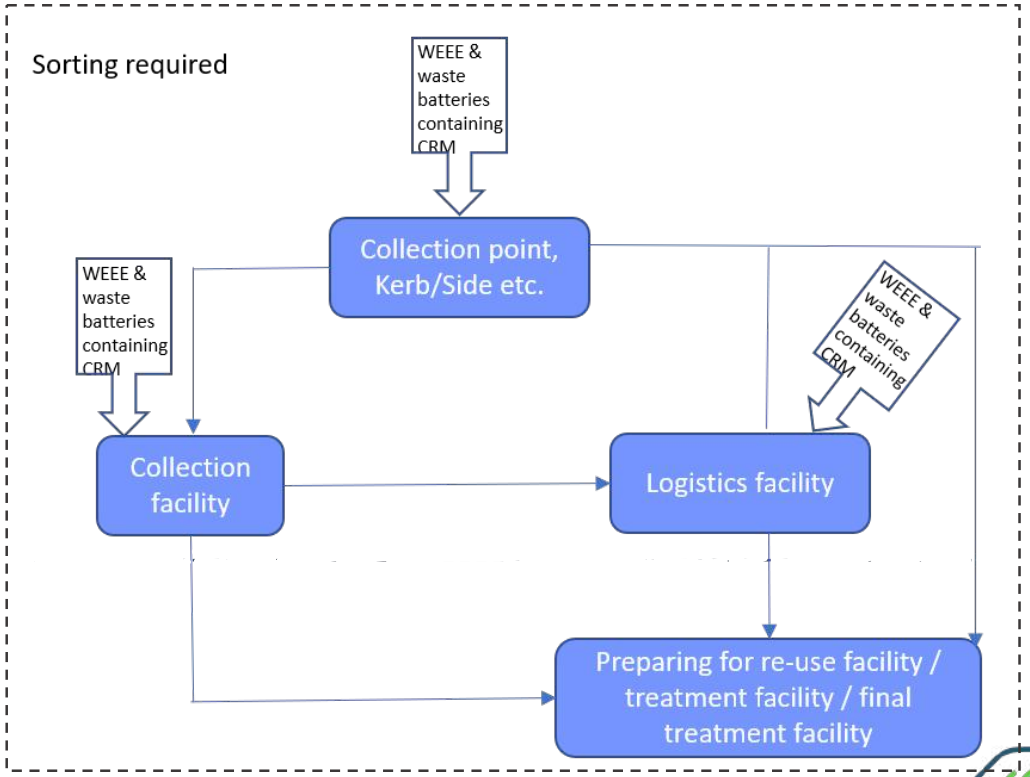
Sorting of WEEE and waste batteries aims at avoiding the mixing or dilution of CRM and at improving the CRM concentration in the output flows (5.8)

5.8 Objectives of sorting

- Avoiding CRM mixing or dilution in the mass flow
- Whenever feasible, avoiding the mixing of CEWASTE compliant CRM sources with unspecified ones
- Improving the concentration of CRM in the output flows
- Meeting the requirements for further treatment or recycling

Sorting of key CRM equipment collected separately at collection points and delivered to sorting facilities only by properly trained personnel, aware of the sorting criteria

Not separately collected CRM at collection points shall be sorted at the treatment facilities



Separate sorting of lead-acid from lithium-ion waste batteries and separate sorting of NdFeB magnets from non-NdFeB magnets (5.8.1&2)

5.8.1 Sorting of waste batteries

- Separate sorting of specifically spent lead-acid, lithium-ion and NiMH batteries

5.8.2 Sorting of waste magnets

- Separate sorting of NdFeB magnets removed from household appliances, compressors of temperature exchange equipment (TEE), HDD in laptops desktop computers, large loud-speakers, and from electric engines of end-of-life vehicles from other non-NdFeB magnets
- Removal of non-NdFeB-magnets from the treatment process and final processing unless it is ensured that the final treatment of the magnets tolerates non-NdFeB-magnets fractions without loss of recycling performance

Source Picture: Creative Common C0

Checklist example: Sorting (5.8)

5.8

Is WEEE containing CRM (not intended for re-use) collected and sorted in order to avoid CRM mixing or dilution, to improve concentration of CRMs in output flows, and to meet requirements for further treatment?

Check that staff at the collection points have been trained for this sorting and separation as well as the existence of panelling or signals with detailed indications about where they should sort the KCEs

WEEE should be sorted into different streams at a collection or logistics facility in order to prevent damage so as not to emit substances harmful to humans or the environment.

Check if the bins etc. used suitable for this purpose

5.8

Is the personnel responsible for sorting KCE at collection/treatment facilities properly trained and able to sort KCEs?

How would you verify the knowledge and competences of the personnel?

The auditors shall ask questions to be sure that the staff has been trained. For example questioning sorting procedures and where to sort different types of KCEs

5.8.2

Are NdFeB-magnets removed from KCE sorted from others non-NdFeB-magnets?

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Removal practices should not damage components in a way that this will hinder subsequent CRM recovery (5.10)

5.10 Treatment of non-depolluted WEEE and fractions

- Ensure that removal practice do not damage components, hindering the recovery of CRM
- Treatment of fractions containing both CRM and hazardous components in a manner allowing effective de-pollution and high recycling efficiency

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  - Final treatment for recovering CRM fractions and disposal of waste fractions 5.12

Components containing CRM should be removed from key CRM equipment listed in Annex I (5.11)

5.11 Removal of CRM-containing components

- Compliance of removal practices with health and safety requirements
- Only conducted by trained personnel using appropriate tools
- Transportation of key CRM equipment to specialized dismantling plants in case no trained personnel is available at site
- Transportation of waste batteries and lamps as dangerous waste
- Prohibition to deliver hazardous substances or CRM materials into the environment during removal practices
- Ensuring that the removal practices do not hinder the treatment of CRM components
- Transfer of removed CRM to further treatment facilities

Source Comp.	Key CRM Equipment	Waste Type	CRMs	Required/Viable Input for End-processing	Current Economic Feasibility
Fluorescent powders	Fluorescent lamps	WEEE	Eu, Tb, Y, Ce, La	Fluorescent powder	No*
	CRT monitors and TVs		Y, Tb, Eu, Gd,La, Ce	Fluorescent powder	
Nd-magnets	Temperature exchange equipment (engine, compressor)	WEEE	Nd (+ Dy, Gd, Pr, Tb)	Magnets	No
	Household appliances other than temperature exchange equipment (motors/drives)				
	Laptops (HDD)				
	Desktop Computers, prof. IT (HDD)				
	BEV, (P)HEV (electro engine)	ELV			
Printed Circuit Board	Desktop computers, prof. IT	WEEE	Au, Ag, Bi, Pd, Sb	Entire devices w/o battery (mobile phones), PCBs (shredded, unshredded), CuPM granulate	Yes
	Laptops				
	Mobile phones				
	Tablets				
	External CDDs, ODDs, devices with internal CDDs/ODDs				
Li-ion batteries	Laptops	WEEE	Co	Batteries	Yes
	Mobile phones				
	Tablets				
	Li-ion batteries in other WEEE				
	BEV, (P)HEV	ELV			
NiMH battery	NiMH batteries in WEEE	WEEE	Co, Ce, La, Nd, Pr	Batteries	Yes (Co) / No (REEs)
	HEV	ELV			
Lead acid batteries	Lead-acid batteries	WEEE	Sb	Batteries	Yes
		ELV			

*Recent developments in countries outside the EU have been reported but detailed information about the economic feasibility is not yet available.

Records of CRM containing components (5.11)

5.11 Records of the operator include:

- the weight and/or number of incoming KCE and of components removed
- the weight and/or number of components removed handed over for further treatment
- The identification of the treatment facility receiving removed CRM components

5.11.1 Removal of print circuit boards

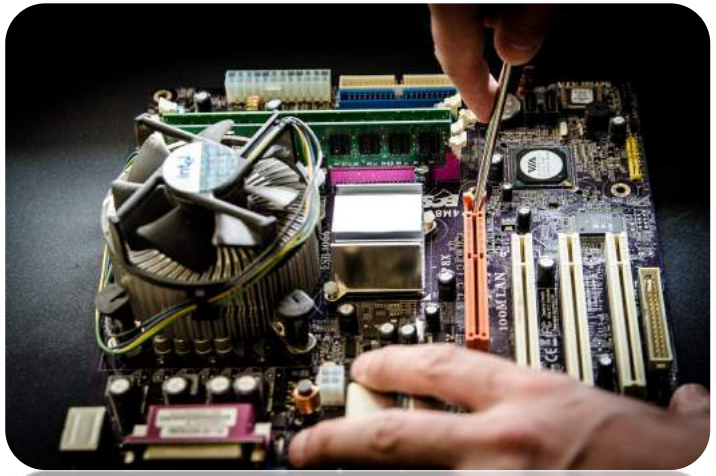
- Manually or mechanically removal of PCB from computers, laptops, tablets, mobile phones as well as external/internal compact/optical disc drives (in order to recover gold, silver and palladium during final treatment)

Checklist example: Removal of CRM-containing components (5.11)

5.11

Are all components containing CRM removed from Key CRM equipment?
Do removal practices comply with health and safety requirements?
Are all removal practices conducted by trained personnel?
Are the removal practices carried out in a way that no hazardous substances or CRM materials are emitted to the environment?
Are the removal practices applied appropriated, so that the subsequent treatment of CRM containing components is not hindered?
Are the removed Key CRM components transferred for further treatment?
Are all records available? • The weight and/or number of incoming KCE and of components removed • The weight and/or number components removed handed over for further treatment • The identification of the treatment facility receiving removed CRM components

Verify for each KCE!



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The separated fractions/components containing CRM shall be treated by facilities that are designed for the recycling of CRM and compliant with the CEWASTE requirements (5.12)

5.12 Final treatment for recovering CRM fractions and final disposal of waste fractions

- The final treatment concerns the priority CRM or alloys selected for recovery and the final processing technology identified
- Taking into account the technological processing, thermodynamic end economic limitations in the selection of priority CRM or alloys for recovery
- Once the final treatment process is completed, records of the operator include:
    - for fractions that have reached **end-of-waste status**:
        - data on the composition shall be recorded
    - for fractions that contain **CRM**:
        - detailed data about the mass of the fraction, the composition, information on the first acceptor and the downstream acceptor(s), and the final treatment technologies
    - for fractions that are classified as **hazardous**:
        - data on the mass, the composition, information on the first acceptor and the downstream acceptor(s) of the fractions, and the final treatment technologies
    - from the **acceptor**:
        - name, address of treatment facility, treatment technology and permit issued by the authority
    - in the case of **NdFeB-magnets** recycling:
        - the mass of CRM (rare earth elements in magnets) recycled

Different waste streams require different specific requirements for final treatment (5.12)

5.12.2 Final treatment of fluorescent powders

- Application of best available technologies capable to recover CRM contained in fluorescent powders from lamps while preventing any adverse effect on the environment

5.12.3.1 Final treatment of lead-acid waste batteries

- Breaking down batteries before their entrance in the smelter
- No manual breaking but through state-of-the-art techniques, such as automatic battery breaking
- Batteries drainage only in a designated area
- Collected acid to be either prepared for re-use, converted to a saleable product or neutralized
- Acid-resistant and sealed acid collection system
- Obligations for the operator to follow the requirements in the EC JRC Reference Document for the Non-Ferrous Metals Industries (2017)
- In countries without recycling efficiency rate:
    - Obligation to achieve a recycling efficiency target of 65%, with a recycling lead content between 85% and 100%

Plastic batterie cases require a special treatment according to EC JRC Best Available Techniques - Reference Document for the Non-Ferrous Metals Industries (2017) (5.12.3.1)

5.12.3.1 Sound recycling of plastic battery cases

- Execution of at least three washing cycles for plastic cases of lead-acid batteries, one of them using an alkaline solution, before they can be recycled or sold to the market for further processing

5.12.3.1 Sound smelting and refining of lead

- Ventilation of all furnace emissions to a baghouse in order to avoid lead-contaminated fume and dust entering the workplace or the atmosphere
- Proper ventilation of the furnace and daily monitoring of the suction of the fume hood
- Capture of the highly toxic filtered dust in airtight containers and either processed on site or disposed of in an environmentally sound manner.

5.12.3.1 Management of process waste, including filter dust and slags

- Recycling of all lead-containing wastes within the facility with a view to prevent emissions of lead-compounds into the environment and to minimize process waste for final disposal.
- If not possible: disposal on a suitable final site, with a written agreement documenting the environmentally sound disposal in the final disposal facility

The final treatment of lithium-ion batteries in an environmentally sound manner requires proper dismantling (5.12.3.2)

5.12.3.2 Discharge and dismantling

- After removal, obligation to discharge lithium-ion batteries from electric vehicles (for example by using a discharge device) before being disassembled to separate the battery packs and modules
- Discharge of the pack to a safe voltage below 0.5V
- For entering into a pyrometallurgical processing, no need to dismantle removed battery further down to the level of the individual cells. Treatment of the module or cells without further discharging
- For hydrometallurgical or mechanical processes, disassembly of the module into cells. Shredding or thermal treatment of the cells
- After the module/cells dismantling, possibility to further chemical/complete discharge the battery depending on the types of recycling technologies
- During physical discharge, important to ensure the safety with more than 380V DC current, possibility of fire, leakage of electroclyte or explosion of the pack
- Monitoring and record of the condition of each cell in the pack in order to rapidly detect defective cells and activate the alarm
- Dismantling of the batteries only by trained personnel or by dismantling robots. Removal of the case and disconnection of the cable during this phase
- Materials to be separated, recycled in-house or transported to recycling plants: aluminum, copper cables, steel components, electronic components (battery management system, printed circuit board), screws and plastic components
- In case of transportation, required to safely pack, with sand or vermiculite, the lithium-ion batteries from electrical vehicles

For the final treatment step, lithium-ion waste batteries can be recycled through either pyrometallurgical or hydrometallurgical processes (5.12.3.2)

Pyrometallurgical

- Process of lithium-ion waste batteries packs or cell modules in a smelter or furnace to reduce the metal oxides into a metallic phase or an alloy
- Further refining of the metal bullion using a hydrometallurgical technology
- Recovery of nickel and cobalt sulphate
- Possibility to also process active materials powder (from hydrometallurgical process)

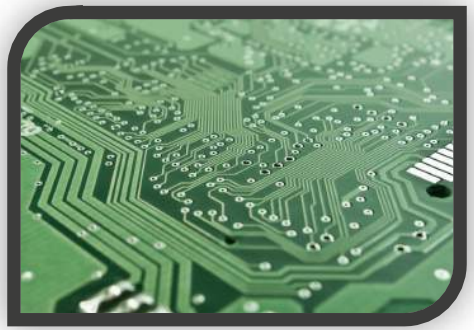
Hydrometallurgical

- Requirement of thermal treatment and separation of different components before the acquisition of active materials
- The active material = powder containing both cathode and anode materials
- Obligation to further process active materials powder in order to recover CRM such as cobalt as well as salts or precursors

The yield of cobalt from lithium-ion battery recycling processes shall be at least 90%. Ambitious yields shall also be sought for nickel, copper and lithium.

The final treatment process shall be capable to recover the most CRM contained in magnets: Nd, Pr, Dy, Gd, Tb (5.12.4)

The shredding of PCB together with other materials shall be prevented (5.12.5)



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Checklist example: Final treatment for recovering CRM fractions, general (5.12)

5.12

Can the operator proof that the separated fractions/components containing CRM are treated by facilities that are designed for the recycling of CRM and compliant with the CEWASTE requirements?

- Treatment operator responsible for the entire material flow up to the process of recycling, incineration or landfilling (end of waste status)
- It should be possible to check the contractual and legal requirements at external secondary recyclers
- The treatment operator must be aware of:
  - The processes its (downstream) treatment partners are involved
  - Which fractions are generated and
  - How they are further processed, recycled or disposed of
- The operator shall document each fraction in the downstream treatment chain until the end of the treatment and until the end-of-waste status is reached
- Corresponding documents must be presented during the audit

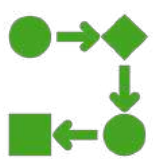
5.12

For fractions that contain CRM, is the operator able to show records of detailed data about the mass of the fraction, the composition, information on the first acceptor and the downstream acceptor(s), and the final treatment technologies?

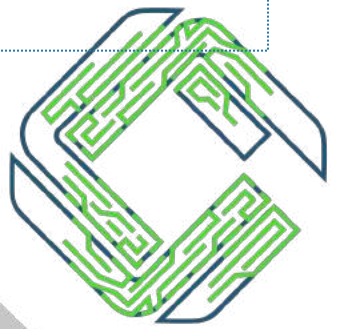
5.12

Is the operator able to show records of data on the composition of fractions that have reached end-of-waste status?

Can you give examples of information the operator shall record?



- For fraction that have reached end-of-waste status:
  - data on the composition
- For fractions that contain CRM:
  - Detailed data about the mass of the fraction
  - The composition
  - The information on the first acceptor and the downstream acceptor(s)
  - And the final treatment technologies
- For fractions that are classified as hazardous:
  - Data on the mass
  - The composition
  - The information on the first acceptor and the downstream acceptor(s) of the fractions
  - The final treatment
- From the acceptor, name, address of treatment facility, treatment technology and permit issued by the authority
- In the case of NdFeB-magnets recycling:
  - the mass of CRM recycled



Checklist example: Final treatment for recovering CRM fractions, li-ion batteries (5.12)

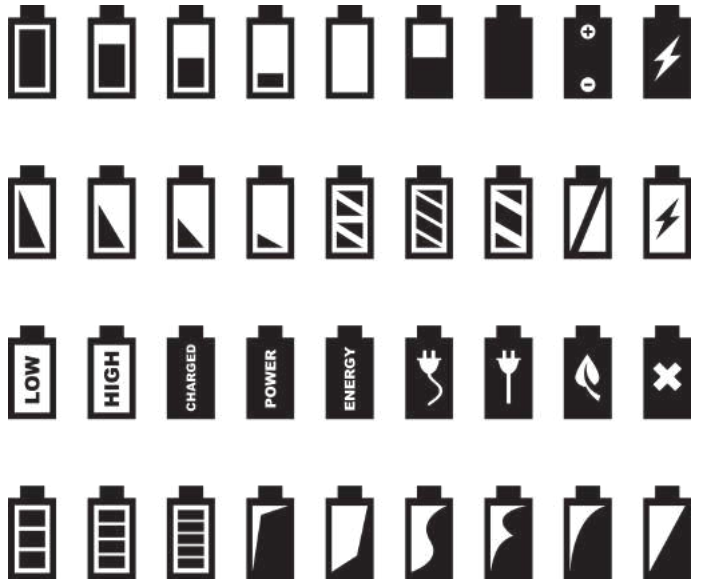
5.12.3.2

Is the condition of each cell in the pack automatically monitored and recorded, so that defective cells can be detected? Is there an alarm system in case of a defective cell?

If the final treatment process is based on hydrometallurgical or mechanical processes, are the modules disassembled into cells?

Can the operator proof that the dismantling is done by trained personnel with suitable equipment?

Are the batteries discharged before being disassembled to a safe voltage blow 0.5 V?



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Checklist example: Final treatment for recovering CRM fractions, fluorescent powders (5.12)

5.12.2

Can the treatment operator proof that they apply best available technologies capable to recover CRM contained in fluorescent powders from lamps, while preventing any adverse effects on the environment?

Final treatment of the CRM oxides consisting of hydrometallurgical recovery of metals requires two main steps:

- Leaching, in which the soluble fraction contained in a solid phase is removed as a solution. This step dissolves the metals of interest and, depending on conditions, other undesired constituents present in the material
- Separation of the metals of interest from each other and/or from undesired elements present in solution using e.g. solvent extraction, ion exchange and/or precipitation

Due to current Eu and Y prices, hydrometallurgical processes tend not to be economically

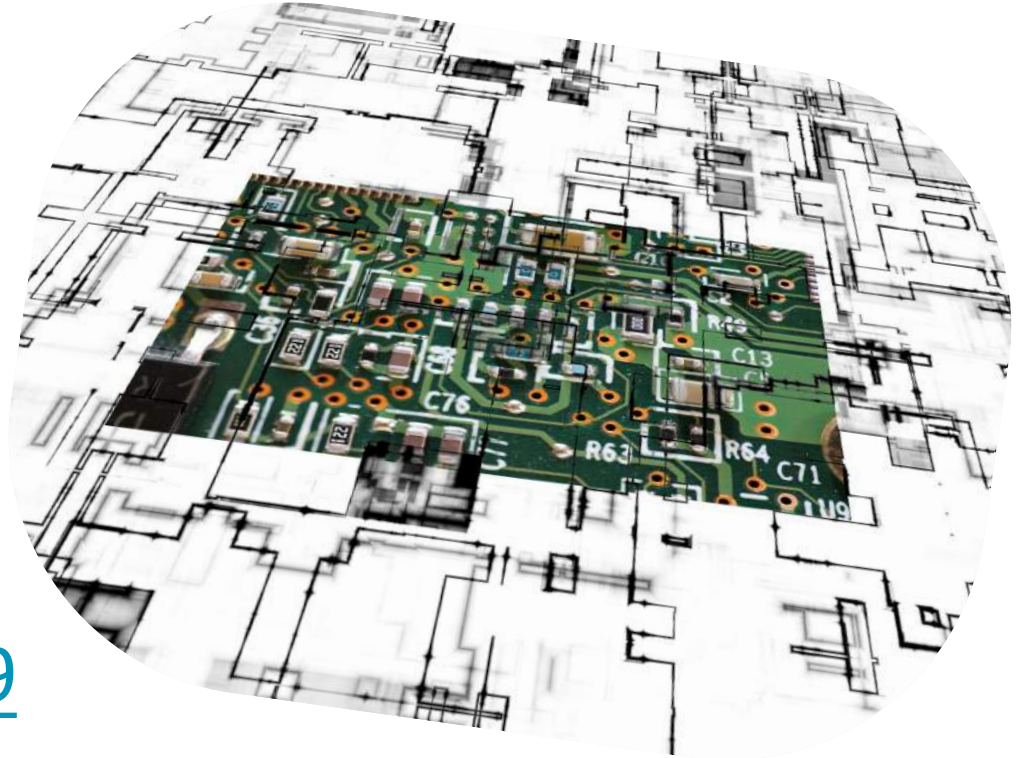
Next steps

Next steps

- Next training webinars:
  - **03.04.2020,** from 1 pm to 5 pm CET: **EN 50625 Training I** - Introduction, administrative & organizational requirements
  - **07.04.2020**, from 1 pm to 5 pm CET: **EN 50625 Training II** - Collection & logistics, technical requirements
- **External auditors**: please register for webinars + read and sign the auditor contract
- We will inform you on decisions made regarding the CEWASTE pilot auditing timeline

Thank you for your attention!

And please provide your feedback:
https://forms.gle/9SEYEUow89s2afAz9



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ANNEX C: WEBINAR ON EN 50625 STANDARDS – INTRODUCTION, ADMINISTRATIVE & ORGANISATIONAL REQUIREMENTS

CEWASTE

Training Webinar

Part III: WEEELABEX/EN50625 I: Introduction, administrative & organizational requirements

Paula Costa, Development Manager

WEEELABEX Organisation

WEEELABEX
CONFORMITY & VERIFICATION

sofies
leading sustainability

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement № 820859

Welcome

Introduction

Paula Costa

Development Manager – Weeelabex Organisation

Member of WEEELABEX Group of Experts

WEEELABEX Lead Auditor

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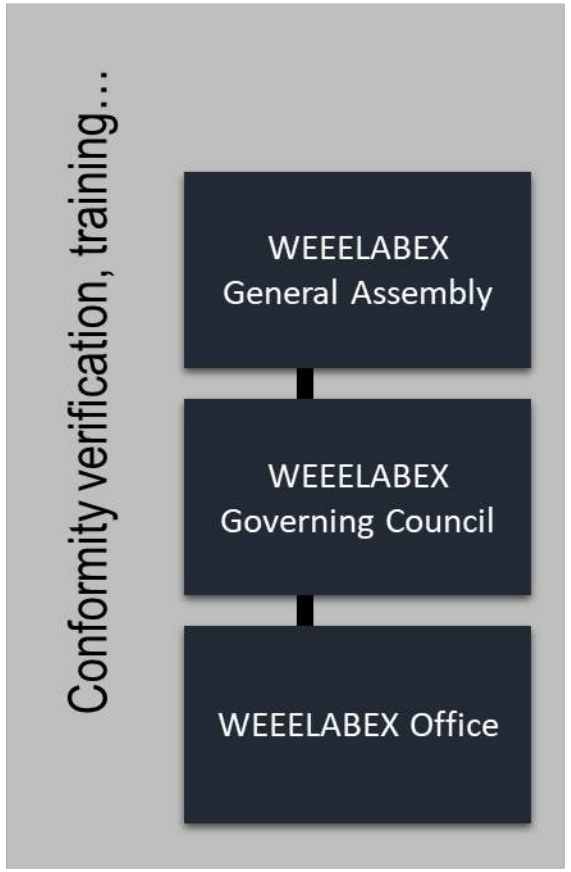
WEEELABEX Organisation

- International non-profit association
- Headquartered in Prague
- Kick-off in April 2013
- WEEE producer compliance schemes as members



WEEELABEX organisation

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14000 Praha 4

Czech Republic

http://www.weeelabex.org

WEEELABEX VISION/MISSION

WEEELABEX
CONFORMITY & VERIFICATION

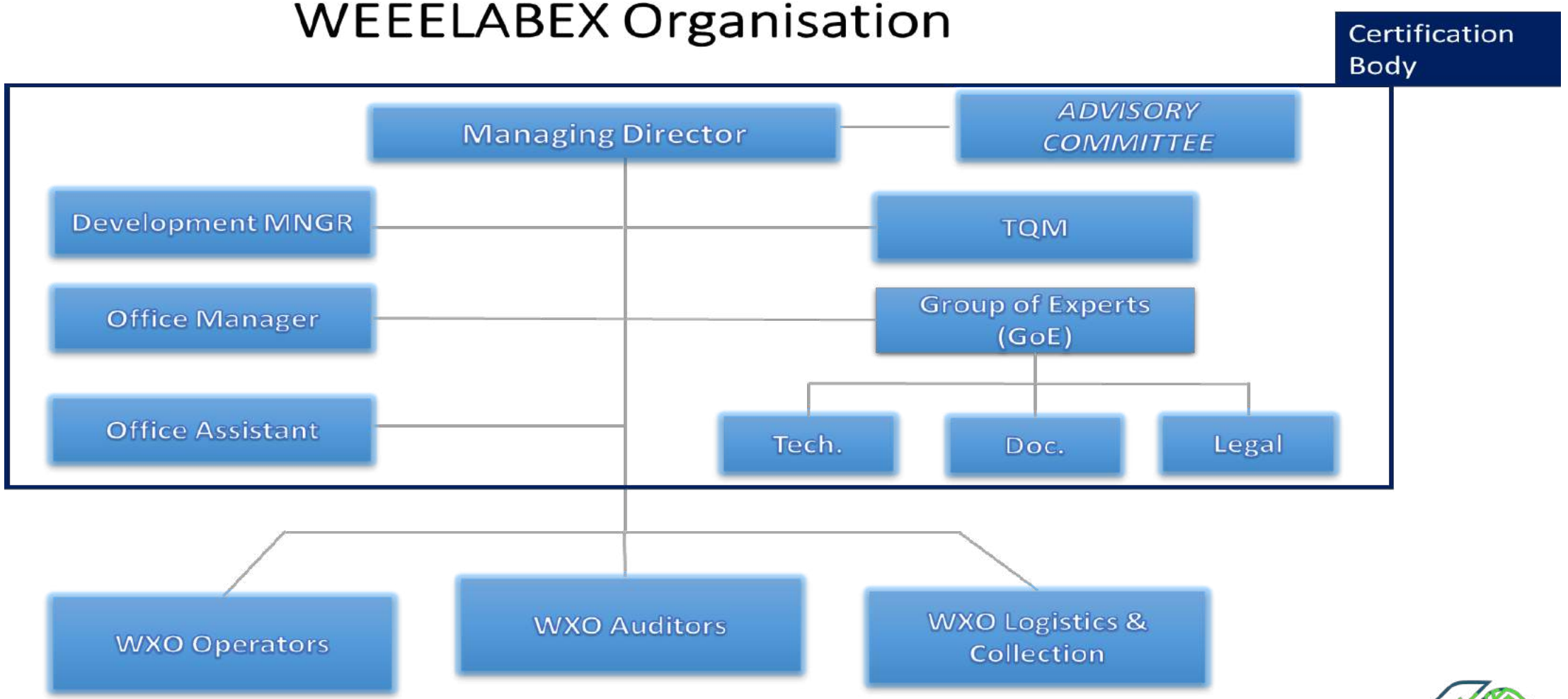
• VISION

- To be the most recognized and respected WEEE centre, train auditors & operators to ensure WEEE is treated in a safe way for a better future.

• MISSION

- To develop and provide quality, service and tools to promote the utilization of excellent WEEE facilities on the market place.

WEEELABEX Organisation



WEEELABEX ORGANISATION

WEEELABEX Office

Petr Novotny (Managing Director)
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Paula Costa (Development Manager)
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Certification Body

- In 2019, the WEEELABEX Organisation reached a very important milestone by obtaining a "**certificate of accreditation**". The accreditation was confirmed by the Czech Accreditation Institute (CAI), a member of the International Accreditation Forum (IAF). The **WEEELABEX scheme accreditation is applicable throughout Europe and even worldwide**. The scope of accreditation covers the:

- certification of **WEEELABEX auditors** (ISO 17024) and

- certification of the **WEEE treatment operators** (ISO 17065).

- The accreditation means that the entire **certification process is fully compliant with the reputable international standards** (ISO 17024 and ISO 17065) ensuring the high quality and recognition of the certificates issued by the WEEELABEX Organisation.
- The certificate issued by the accredited WEEELABEX Organisation is recognized and accepted by EPEAT.

Outline

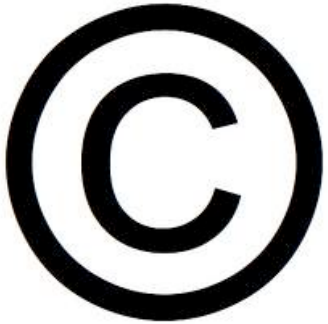
1. Introduction
    - CENELEC and the standards
    - Standards on WEEE treatment
    - Terms and definitions
    - Organisation of the European Standard – EN and Technical Specification – TS

2. Administrative and organisational requirements
    - Requirements of management system
    - Procedures and records to support the management system
    - Training
    - Internal audits

Outline

2. Administrative and organisational requirements
   - Continuous improvement
   - Risk Assessment and Understand the potential risk in WEEE
   - Main Technical and infrastructural characteristics of the treatment facilities
   - Receiving, handling and storage of WEEE prior to treatment
   - Treatment (control and records)
   - Shipment and Waste Shipment Regulations
   - Documentation

INTRODUCTION



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CENELEC AND STANDARDS

CENELEC

CENELEC is the European Committee for Electrotechnical Standardization and is responsible for standardization in the electrotechnical engineering field.

In accordance with the requirement in the WEEE directive (article 8.5), the European Commission requested European Standardization Organisations (ESOs) to develop European standards (ENs) for the collection, logistics and treatment, including recovery, recycling and preparing for re-use, of WEEE.

CENELEC was designated as a European Standards Organization by the European Commission, CENELEC is a non-profit technical organization set up under Belgian law.

CENELEC AND THE STANDARDS

The process of making standards is transparent and consensus-based.

The European Standards (ENs) are reviewed every 5 years and the Technical Specifications (TS) every 3 years, thereby reflecting the state-of-the-art of technologies and market needs, and they can be used to support legislation. Standards have a harmonizing effect and can remove trade barriers and enhance economic growth.

CENELEC AND THE STANDARDS

European Standard – EN

- Highest level of consensus – review in max. 5 years
- All relevant stakeholders
- Mandatory implementation by all Members

Technical Specification – TS

- Limited level of consensus - review in max. 3 years
- All relevant stakeholders
- No mandatory implementation by Members
- No immediate need for national implementation or EN, no consensus can be reached
- Can be transformed into a EN

CENELEC AND THE STANDARDS

ENs are periodically reviewed at intervals not exceeding 5 years.

As a result of the review the EN shall be:

a) confirmed, or

b) amended, or

c) revised as a new edition with a new date, or

d) withdrawn.

A TS is reviewed every 3 years at the latest.

Objectives of the standards

- Assist treatment operators in fulfilling the requirements of the WEEE Directive without placing unnecessary administrative burdens on operators of any size, including small and medium sized enterprises (SMEs).

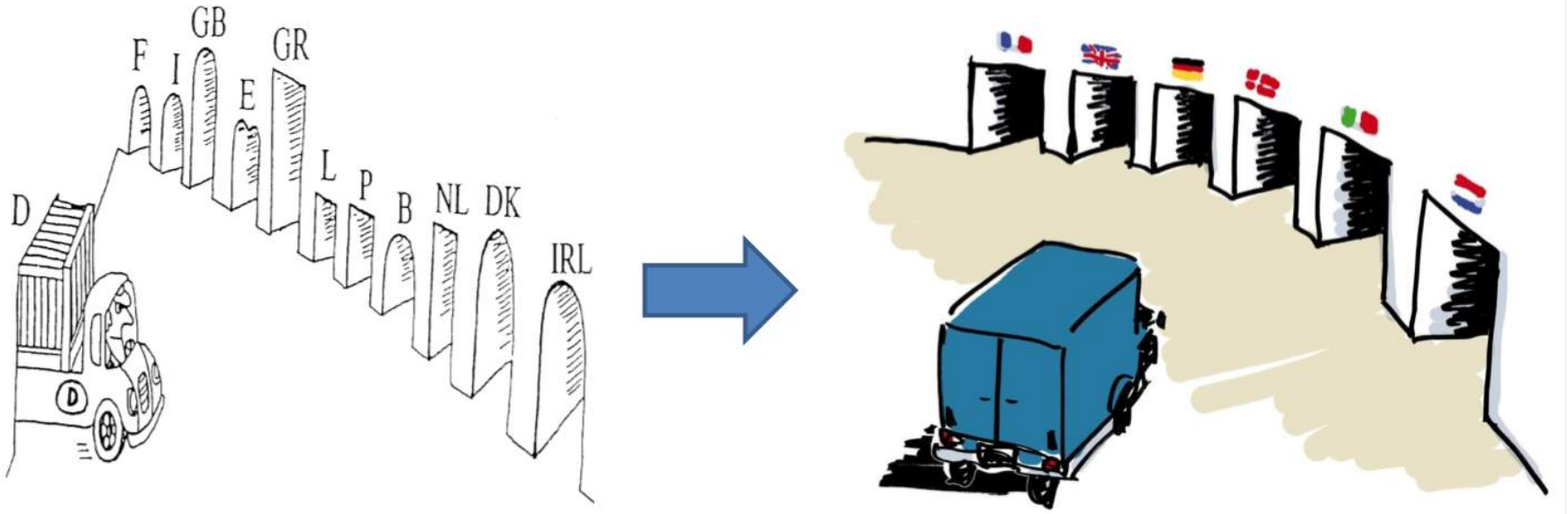
- Give additional guidance to operators.

- Cover the treatment of waste from all products within the extended scope of the WEEE Directive.

- Cover the collection and logistics of WEEE to allow proper treatment.

Objectives of the standards

Removing trade barriers ...



Standards Vs. Legislation

Standards	Legislation
• Voluntary (unless mandated by legislation)	Mandatory
• Consensos of stakeholders	Imposed by law
• Developed by private stakeholders	Established by authorities
Provide technical specifications & test methods for products, services, & processes	Requirements to protect public interests
Harmonisation	Harmonisation

Standards

Environmental benefits

- Better depollution
- Better recycling rates
- Resource efficiency
- Circular economy

Economic benefits

- Fair competition among recyclers
- Fair competition for producers
- Economies of scale in recycling industry
- Reduced grey market, hence more tax revenues

Standards on WEEE treatment

Standards on WEEE treatment

European standards relevant for WEEE treatment include the following:

- EN 50574 on the collection, logistics & treatment requirements for end-of-life household appliances containing volatile fluorocarbons or volatile hydrocarbons
- TS 50574-2: Collection, logistics & treatment requirements for end-of-life household appliances containing volatile fluorocarbons or volatile hydrocarbons - Part 2: specification for de-pollution
- EN 50625-1: Collection, logistics & treatment requirements for WEEE - Part 1: General treatment requirements
- TS 50625-3-2: Collection, logistics & treatment requirements for WEEE -- Part 3-2: Specification for de-pollution – Lamps

Standards on WEEE treatment

- EN 50625-2-2: Collection, logistics & treatment requirements for WEEE -- Part 2-2: Treatment requirements for WEEE containing CRTs and flat panel displays
- TS 50625-3-3: Collection, logistics & treatment requirements for WEEE -- Part 3-3: Specification for de-pollution- WEEE containing CRTs and flat panel displays
- EN 50625-2-3: Collection, logistics & treatment requirements for WEEE -- Part 2-3: Treatment requirements for temperature exchange equipment
- TS 50625-3-4: Collection, logistics & treatment requirements for WEEE -- Part 3-4: Specification for de-pollution- temperature exchange equipment
- EN 50625-2-4: Collection, logistics & treatment requirements for WEEE -- Part 2-4: Treatment requirements for photovoltaic panels
- TS 50625-3-5: Collection, logistics & treatment requirements for WEEE -- Part 3-5: Specification for de-pollution- photovoltaic panels

Standards on WEEE treatment

- TS 50625-4: Collection, logistics & treatment requirements for WEEE -- Part 4: Specification for the collection and logistics associated with WEEE
- TS 50625-5: Collection, logistics & treatment requirements for WEEE -- Part 5: Specification for the end-processing of WEEE fractions- copper and precious metals
- EN 50614: Requirements for the preparing for re-use of waste electrical and electronic equipment

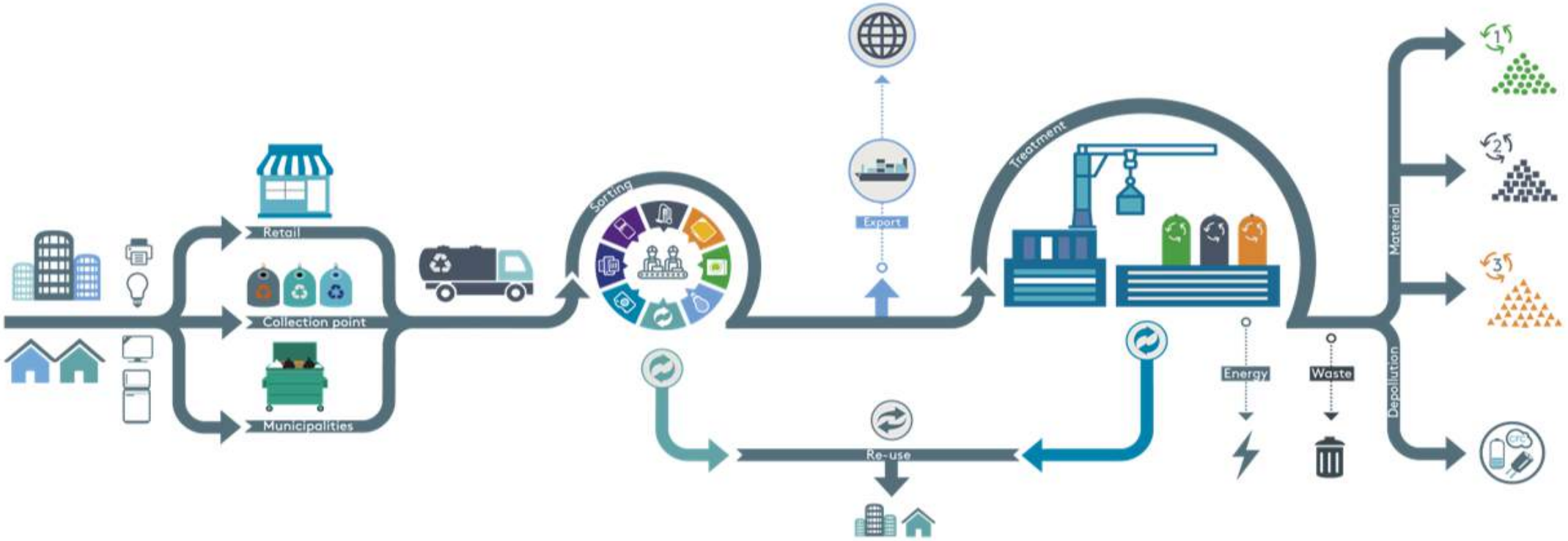
CENELEC current situation and future development

WEEELABEX
CONFORMITY & VERIFICATION

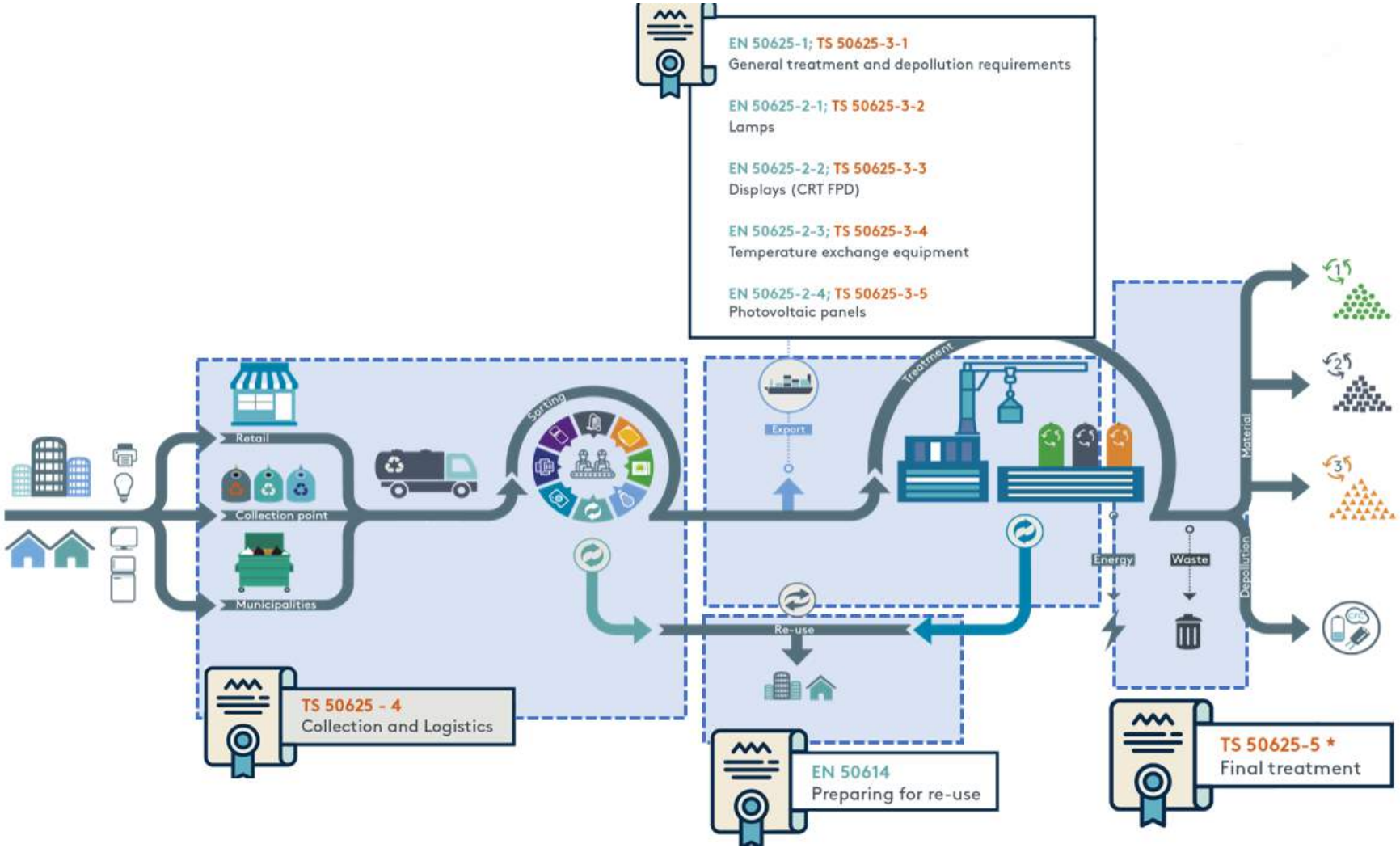
Calculated dates for deciding on document revisions

Row Labels	Date of Availabilty	Decide on document updating
GEN		
EN 50625-1 General	March, 2014	March, 2019
TS 50625-3-1 General	January, 2015	January, 2018
LAMP		
EN 50625-2-1 Lamps	December, 2014	December, 2019
TS 50625-3-2 Lamps	May, 2016	May, 2019
CRT FPD		
EN 50625-2-2 CRT FPD	May, 2015	May, 2020
TS 50625-3-3 CRT FPD	August, 2017	August, 2020
TEMP		
EN 50625-2-3 Temp. Exchange	July, 2017	July, 2022
TS 50625-3-4 Temp. Exchange	July, 2017	July, 2020
PV		
EN 50625-2-4 PV	November, 2017	November, 2022
TS 50625-3-5 PV	November, 2017	November, 2020
CL		
TS 50625-4 Col. & Log.	June, 2017	June, 2020
FIN		
TS 50625-5 Final processing	August, 2017	August, 2020
TR		
TR 50625-6 Technical Report	June, 2018	

Collection, Transport, Re-use and Treatment



Collection, Transport, Re-use and Treatment



Terms and definitions

Terms and definitions

Every profession has its own lexicon. It is important to communicate with your peers and to understand some terms and definitions.

Acceptor - organization that physically and/or contractually takes ownership of WEEE fractions, after processing has been carried out by a treatment operator
first acceptor- acceptor that directly accepts one or more WEEE fractions from the treatment operator
downstream acceptor - every acceptor in the treatment chain following after the first acceptor

final acceptor - acceptor where the final treatment step takes place

Examples of final treatment steps are material recycling, energy recovery and disposal.

Final acceptors receive final fractions.

Terms and definitions

Collection - gathering of WEEE, including the preliminary sorting and preliminary storage of WEEE for the purposes of transport to a logistics facility or a treatment facility.

The term “collection'' is defined in Directive 2008/98/EC.

Collection facility - location designated for the gathering of WEEE to facilitate separate collection

Collection facilities are typically registered, listed, or otherwise approved or designated in accordance with the national legislation implementing Directive 2012/19/EU and Directive 2008/98/EU.

Terms and definitions

Logistics facility - facility for receiving and preparing for transportation to WEEE treatment facilities.

Treatment - means recovery or disposal operations , including preparation prior to recovery or disposal.

Treatment facility - location where WEEE undergoes treatment

Terms and definitions

Collection points

- No core business in waste management
- Can be temporary or permanent
- e.g, a collection bin or other collection mechanism provided at a retail or not for profit outlet, public building, community space

Collection facilities

- Core business in waste and7or WEEE collection;
- e.g. a municipal or non municipal collection centre

Logistics facility

- Receiving and preparing for transportation to subsequent treatment or preparing for re-use
- Sorting

Terms and definitions

de-pollution - selective treatment during which certain substances, mixtures and components are removed from the WEEE stream

Annex F, of the EN 50625-1, identifies which (certain) substances, mixtures and components shall be removed and treated from separately collected WEEE, the process being de-pollution.

De-pollution is concerned only with the removal of substances identified in Annex F whereas the term “removal”, as defined in Directive 2012/19/EU, is concerned with the removal of hazardous substances.

Terms and definitions

end-of-waste - result of treatment whereby the resulting fractions are no longer classified as waste

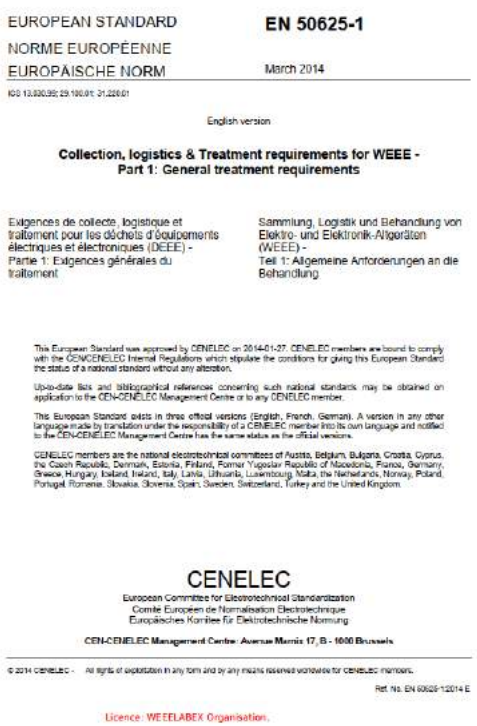
Note 1 to entry: Fractions that cease to become waste, following a recovery or recycling operation in compliance with specific criteria according to Article 6 of Directive 2008/98/EC, are regarded as secondary materials and so have achieved end-of-waste status.

Organisation of the European Standard – EN and Technical Specification – TS

Main Goal of the standards

- Achieving recycling and recovery rates
- Avoiding release hazardous substances into the environment
- Protecting health and safety of the workers during the treatment process
- To have all the treatment processes under control, including down-stream routes
- Compliance with legal requirements

Organisation of the standard EN 50625-1



EUROPEAN STANDARD **EN 50625-1**
NORME EUROPÉENNE
EUROPÄISCHE NORM March 2014

ICS 13.030.99; 29.100.01; 31.220.01

English version

Collection, logistics & Treatment requirements for WEEE - Part 1: General treatment requirements

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 1: Exigences générales du traitement

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 1: Allgemeine Anforderungen an die Behandlung

This European Standard was approved by CENELEC on 2014-01-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 50625-1:2014 E

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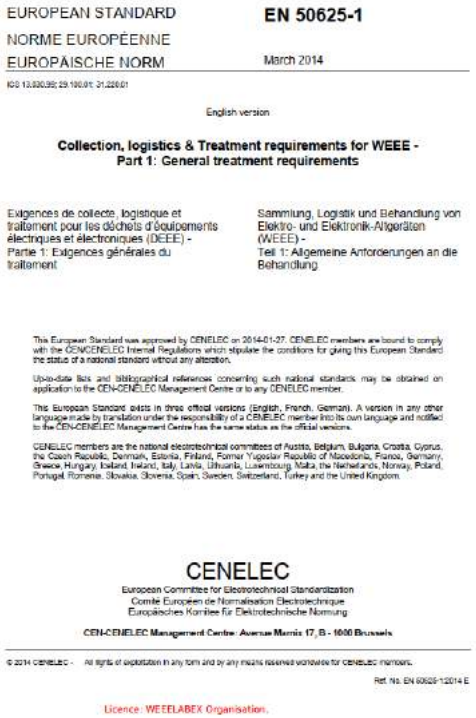
2 Normative references
3 Terms and definitions
4 Administrative and organisational requirements 4.1 Management principles 4.2 Technical and infrastructural pre-conditions 4.3 Training 4.4 Monitoring 4.5 Shipments
5 Technical requirements 5.1 General 5.2 Receiving of WEEE at treatment facility 5.3 Handling of WEEE 5.4 Storage of WEEE prior to treatment 5.5 De-pollution 5.6 De-pollution monitoring 5.7 Treatment of non de-polluted WEEE and fractions 5.8 Storage of fractions 5.9 Recycling and recovery targets 5.10 Recovery and disposal of fractions

Organisation of the standard EN 50625-1



EUROPEAN STANDARD **EN 50625-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM March 2014

ICS 13.030.99; 29.160.01; 31.220.01

English version

Collection, logistics & Treatment requirements for WEEE - Part 1: General treatment requirements

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Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 1: Allgemeine Anforderungen an die Behandlung

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Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 50625-1:2014 E

Contents
6. Documentation
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Annex C - Determination of recycling and recovery rates
Annex D - Requirements concerning processing of a batch
Annex E - annex has been included for future use
Annex F - Materials and components of WEEE requiring selective treatment
Annex G - Documentation for downstream monitoring and establishment of recycling and recovery rates
Annex ZZ - Coverage of Requirements of Commission Directive (EU) 2012/19/EU

Organisation of the standard TS 50625-3-1: Specification for de-pollution - General

TECHNICAL SPECIFICATION
SPECIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CLC/TS 50625-3-1

January 2015

English Version

Collection, logistics & treatment requirements for WEEE - Part 3-1: Specification for de-pollution - General

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

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This Technical Specification is intended to be used in conjunction with the WEEE Treatment Standard EN 50625-1 for most types of WEEE

Contents
1 Scope
2 Normative references
3 Terms and definitions
4 De-pollution monitoring 4.1 Introduction 4.2 Target value methodology 4.3 Mass Balance methodology 4.4 Analysis methodology
5 Overview of the applicable methodologies — Applicable methodologies
6 Large appliances 6.1 Introduction 6.2 Target value methodology 6.3 Analysis methodology
7 Cooling and freezing appliances 7.1 Introduction 7.2 Target values methodology 7.3 Mass balance methodology 7.4 Analysis methodology

Organisation of the standard TS 50625-3-1: Specification for de-pollution - General

TECHNICAL SPECIFICATION **CLC/TS 50625-3-1**
SPECIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION
January 2015

English Version

Collection, logistics & treatment requirements for WEEE - Part 3-1: Specification for de-pollution - General

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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Contents
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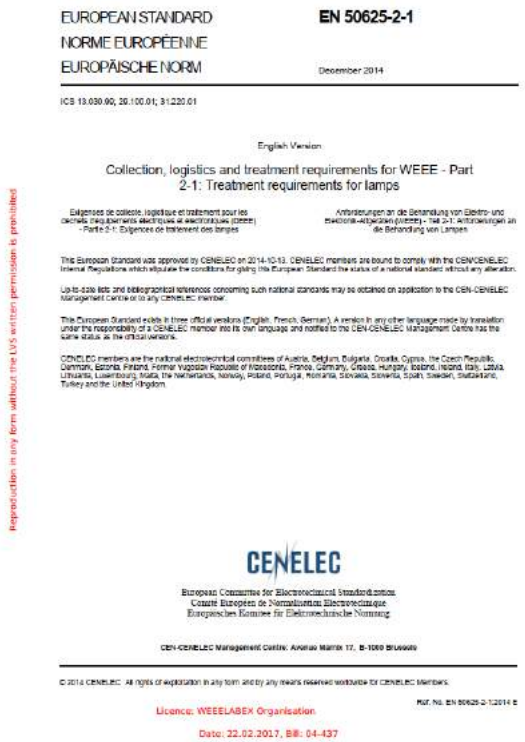
9 Lamps — Introduction and analysis methodology
10 Small appliances 10.1 Introduction 10.2 Target value methodology 10.3 Analysis methodology
11 Protocol for components removed during a batch process 11.1 General procedure 11.2 Capacitors 11.3 Batteries
Annex A (normative) Sampling protocol for the physically smallest non-metallic mechanical treatment fraction
Annex B (normative) Sampling protocol for plastics
Annex C (normative) Targets
Annex D (informative) Target calculation example — Calculation example for large appliance

Organisation of the standard EN 50625-2-1: Treatment requeriments for lamps



EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50625-2-1

December 2014

ICS 13.030.99; 29.100.01; 31.220.01

English Version

Collection, logistics and treatment requirements for WEEE - Part 2-1: Treatment requirements for lamps

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 2-1: Exigences de traitement des lampes

Anforderungen an die Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 2-1: Anforderungen an die Behandlung von Lampen

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Ref. No. EN 50625-2-1:2014 E

Contents

Important

This part 2 is to:

- be used in conjuction with the lasted edition of EN 50625-1;
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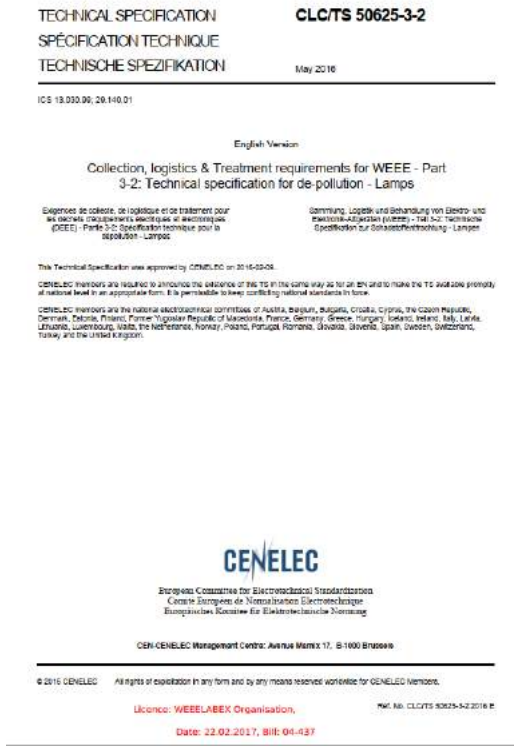
Organisation of the standard TS 50625-3-2: Treatment requeriments for lamps



TECHNICAL SPECIFICATION **CLC/TS 50625-3-2**
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION
May 2016

ICS 13.030.99; 29.140.01

English Version

Collection, logistics & Treatment requirements for WEEE - Part 3-2: Technical specification for de-pollution - Lamps

Exigences de collecte, de logistique et de traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 3-2: Spécification technique pour la dépollution - Lampes

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (EAG) - Teil 3-2: Technische Spezifikation zur Schadstoffentfrachtung - Lampen

This Technical Specification was approved by CENELEC on 2016-03-09.

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Ref. No. CLC/TS 50625-3-2:2016 E

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Important

- This TS supplements or modifies the corresponding clauses in TS 50625-3-1, so as to convert that publication into the TS: Treatment specification for lamps.
- When a particular subclasse of Part 3-1 ins not mentioned in the Part 3-2, that subclasses applies as far is reasonable.
- When states “addition”, “modification” or “replacement” the relevant text in Part 3-1 is to be adapted accordingly.

Organisation of the standard EN 50625-2-2 Treatment requeriments for WEEE containing CRTs and flat panel displays

EUROPEAN STANDARD **EN 50625-2-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM May 2015

ICS 13.030.99, 31.120

English Version

Collection, logistics & Treatment requirements for WEEE - Part 2-2: Treatment requirements for WEEE containing CRTs and flat panel displays

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 2-2: Exigences de traitement pour les DEEE contenant des tubes électroniques et des écrans plats

This European Standard was approved by CENELEC on 2015-04-13. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Ref. No. EN 50625-2-2:2015 E

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Organisation of the standard TS 50625-3-3 Technical specifications for de-pollution – CRTs and FPD

TECHNICAL SPECIFICATION **CLC/TS 50625-3-3**

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION August 2017

ICS 13.030.99; 31.120

English Version

Collection, logistics & treatment requirements for WEEE - Part 3-3: Specification for de-pollution - WEEE containing CRTs and flat panel displays

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 3-3: Spécifications relatives à la dépollution - DEEE contenant des tubes cathodiques et des écrans plats

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 3-3: Spezifikation der Schadstoffentfrachtung - WEEE mit CRT und Flachbildschirmgeräten

This Technical Specification was approved by CENELEC on 2017-06-19.

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Organisation of the standard TS 50625-3-3 Technical specifications for de-pollution – CRTs and FPD

Important

- This TS supplements or modifies the corresponding clauses in TS 50625-3-1, so as to convert that publication into the TS: Treatment specification for de-pollution CRTs and FPDs.
- When a particular subclause of Part 3-1 ins not mentioned in the Part 3-3, that subclasses applies as far is reasonable.
- When states “addition”, “modification” or “replacement” the relevant text in Part 3-1 is to be adapted accordingly.

Organisation of the standard EN 50625-2-3 Treatment requeriments for temperature Exchange equipment and other WEEE containing VFC and/or VHC

EUROPEAN STANDARD **EN 50625-2-3**

NORME EUROPÉENNE

EUROPÄISCHE NORM July 2017

ICS 13.030.99 Supersedes EN 50574-1:2012

English Version

Collection, logistics & treatment requirements for WEEE - Part 2-3: Treatment requirements for temperature exchange equipment and other WEEE containing VFC and/or VHC

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 2-3: exigences de traitement des équipements d'échange thermique et autres DEEE contenant des fluorocarbures volatils et/ou des hydrocarbures volatils

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 2-3: Anforderungen an die Behandlung von Wärmeträgern und anderen Elektro- und Elektronik-Altgeräten die VFC und/oder VFC enthalten

This European Standard was approved by CENELEC on 2017-05-29. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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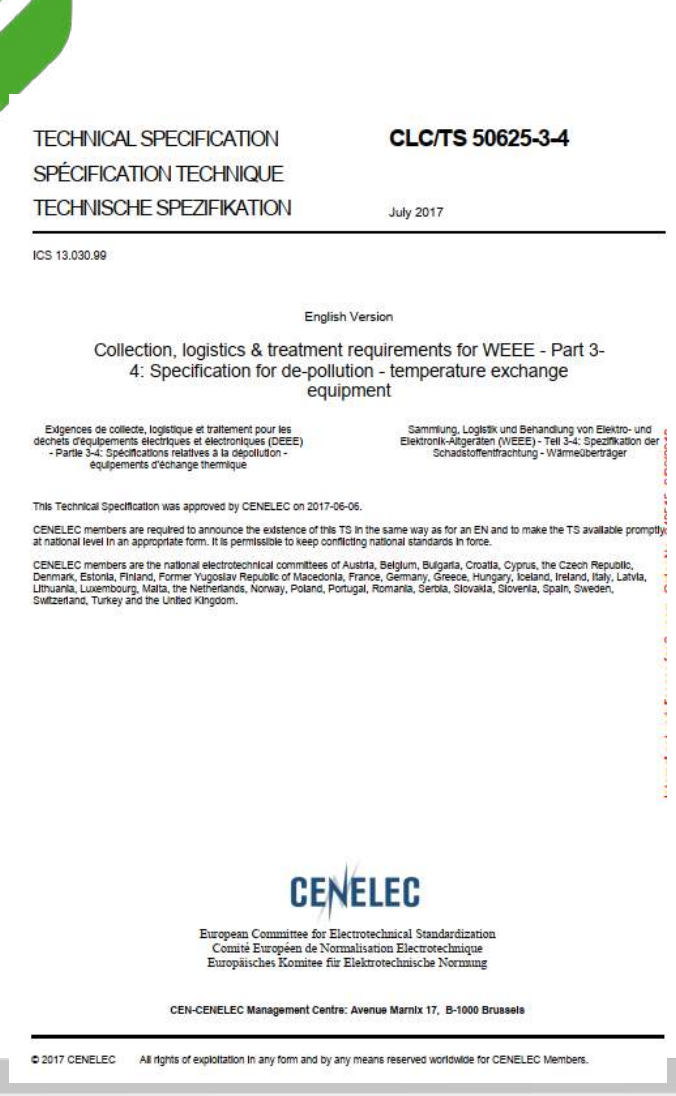
Organisation of the standard TS 50625-3-4 Technical specifications for de-pollution – temperature Exchange equipment



TECHNICAL SPECIFICATION **CLC/TS 50625-3-4**

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION July 2017

ICS 13.030.99

English Version

Collection, logistics & treatment requirements for WEEE - Part 3-4: Specification for de-pollution - temperature exchange equipment

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 3-4: Spécifications relatives à la dépollution - équipements d'échange thermique

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 3-4: Spezifikation der Schadstoffentfrachtung - Wärmeüberträger

This Technical Specification was approved by CENELEC on 2017-06-06.

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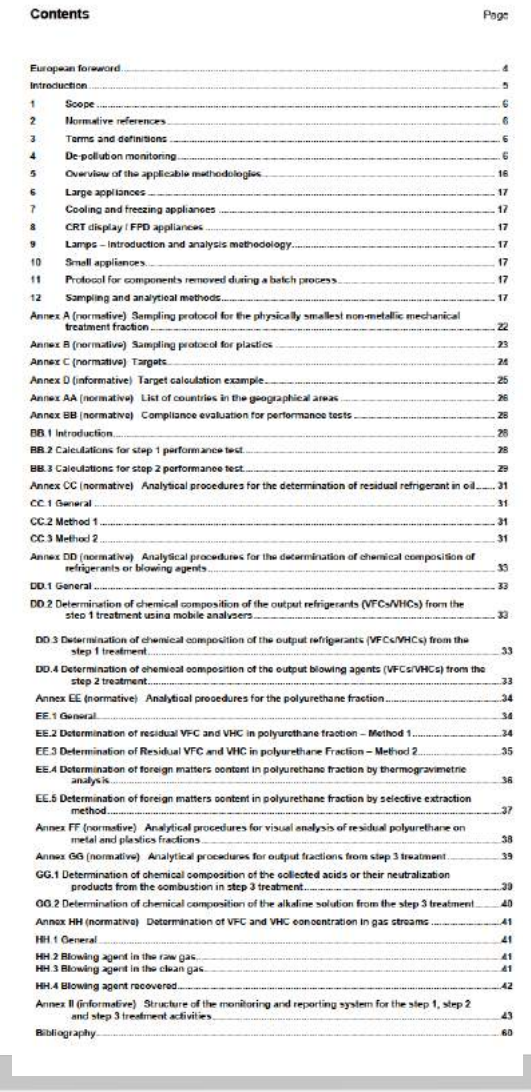

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- This TS supplements or modifies the corresponding clauses in TS 50625-3-1, so as to convert that publication into the TS: Treatment specification for temperature exchange equipment.
- When a particular subclause of Part 3-1 is not mentioned in the Part 3-4, that subclasses applies as far is reasonable.
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Organisation of the standard EN 50625-2-4 Treatment requeriments for photovoltaic painels

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50625-2-4

November 2017

ICS 13.030.99; 27.160

English Version

Collection, logistics & treatment requirements for WEEE - Part 2-4: Treatment requirements for photovoltaic panels

Exigences de collecte, logistique et traitement pour les déchets d'équipements électriques et électroniques (DEEE) - Partie 2-4: Exigences de traitement des panneaux photovoltaïques

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 2-4: Anforderungen an die Behandlung von Photovoltaikmodulen

This European Standard was approved by CENELEC on 2017-09-18. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Organisation of the standard TS 50625-3-5 Technical specifications for de-pollution – Photovoltaic panels

TECHNICAL SPECIFICATION **CLC/TS 50625-3-5**

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION November 2017

ICS 13.030.99; 27.160

English Version

Collection, logistics & Treatment requirements for WEEE - Part 3-5: Technical specification for de-pollution - Photovoltaic panels

Exigences de collecte, logistique et traitement pour les DEEE - Partie 5: Spécification relative au traitement final des fractions de DEEE - Cuivre et métaux précieux

Sammlung, Logistik und Behandlung von Elektro- und Elektronik-Altgeräten (WEEE) - Teil 3-5: Spezifikation für die Endbehandlung der Fraktionen von Elektro- und Elektronik-Altgeräten - Kupfer und Edelmetalle

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Ref. No. CLC/TS 50625-3-5:2017

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- This TS supplements or modifies the corresponding clauses in TS 50625-3-1, so as to convert that publication into the TS: Treatment specification for photovoltaic panels
- When a particular subclause of Part 3-1 is not mentioned in the Part 3-5, that subclasses applies as far is reasonable.
- When states “addition”, “modification” or “replacement” the relevant text in Part 3-1 is to be adapted accordingly.

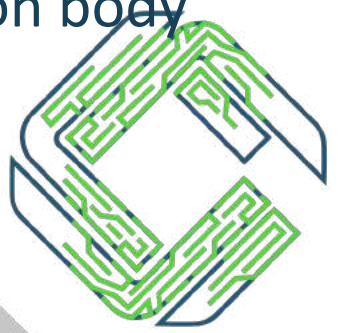
Certification according with CENELEC Standards

When you want to say that a company has implemented a standard, has successfully completed the certification audit, and the certification body has issued the certificate, you would normally call this ***certification*.**

Certification is the procedure by which a third party gives written assurance that a product, process, system or person has met specified requirements.

Accredited certification is a written assurance provided by a third party that has been formally recognised by an accreditation body.

To gain accredited certification, organisations must make sure the certification body they are using has been accredited by a valid accreditation body that is a membership of the International Accreditation Forum (IAF).



Certification according with CENELEC Standards

If a certification body isn't accredited, there's no way of knowing whether it's applying the relevant framework or standard appropriately. There's no one checking that its assessment practices are solid, so it could theoretically be handing out certifications to anyone who applies. As a result, certifications awarded by non-accredited bodies hold little weight.

By contrast, accredited certification proves that a well-respected organisation has verified that the person or organisation has met the relevant requirements. If a regulator, client or prospective employer requests that you are certified, they are almost always referring to accredited certification.

Certification according with CENELEC Standards

WEEELABEX Organisation is a accredited certification body, to perform certification according with EN and TS 50625 series.

Certificate of Accreditation No. 262/2019 of 5/06/2019 valid until 5/06/2024.

Accreditation assures users of the competence and impartiality of the body accredited.

EA MLA Signatory
Český institut pro akreditaci, o.p.s.
Olšanská 54/3, 130 00 Praha 3

issues

according to section 16 of Act No. 22/1997 Coll., on technical requirements for products, as amended

CERTIFICATE OF ACCREDITATION

No. **262/2019**

WEEELABEX Organisation
with registered office U Habrovky 11/247, 140 00 Praha 4, Company Registration No. 01594303

to the Certification Body No. **3238**
Certification Body Operators

Scope of accreditation:

Certification of waste electric and electronic equipment treatment process to the extent as specified in the appendix to this Certificate.

This Certificate of Accreditation is a proof of Accreditation issued on the basis of assessment of fulfillment of the accreditation criteria in accordance with

ČSN EN ISO/IEC 17065:2013

In its activities performed within the scope and for the period of validity of this Certificate, the Body is entitled to refer to this Certificate, provided that the accreditation is not suspended and the Body meets the specified accreditation requirements in accordance with the relevant regulations applicable to the activity of an accredited Conformity Assessment Body.

This Certificate of Accreditation replaces, to the full extent, Certificate No.: 246/2018 of 14. 5. 2018, or any administrative acts building upon it.

This Certificate is valid until: **5. 6. 2024**

Prague: 5. 6. 2019

Jiří Růžička
Director
Czech Accreditation Institute
Public Service Company

Administrative and organisational requirements

Administrative and organisational requirements

1. Requirements of management system;
2. Procedures and records to support the management system;
3. Training;
4. Internal audits;
5. Continuous improvement
6. Risk Assessment and Understand the potential risk in WEEE
7. Main Technical and infrastructural characteristics of the treatment facilities
8. Receiving, handling and storage of WEEE prior to treatment
9. Treatment (control and records)
10. Shipment and Waste Shipment Regulations
11. Documentation

Requirements of management system

A management system is the way in which an organization manages the inter-related parts of its business in order to achieve its objectives. These objectives can relate to a number of different topics, including product or service quality, operational efficiency, environmental performance, health and safety in the workplace and many more.

A management system (MS) is defined as a formalized system that documents processes, procedures, and responsibilities for achieving quality, environmental and H&S policies and objectives or other requirements. A MS helps coordinate and direct an organization's activities to meet customer and regulatory requirements and improve its effectiveness and efficiency on a continuous basis.

The level of complexity of the system will depend on each organization's specific context.

Requirements of management system

The intent of a management system is to ensure that the organization determines the processes needed to support the requirements that they need to fulfill (in this specific case: CENELEC Standard)

This includes not only the processes related with the WEEE treatment, but also the processes that are needed for the effective implementation, such as instructions on how to perform the operations, training; risk assessment; emergency procedures, internal audit, management review and others.

Requirements of management system

The potential benefits to an organization of implementing a management system are:

a) the ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements;
b) facilitating opportunities to enhance customer satisfaction;
c) addressing risks and opportunities associated with its context and objectives;
d) the ability to demonstrate conformity to specified quality management system requirements.

Requirements of management system

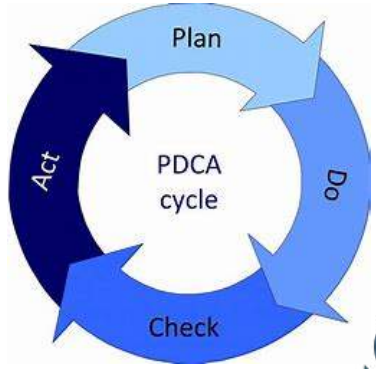
Normally a management system is based in the PDCA cycle, that can be briefly described as follows:

— **Plan**: establish the objectives of the system and its processes, and the resources needed to deliver results in accordance with customers' requirements and the organization's policies, and identify and address risks and opportunities;

— **Do**: implement what was planned;

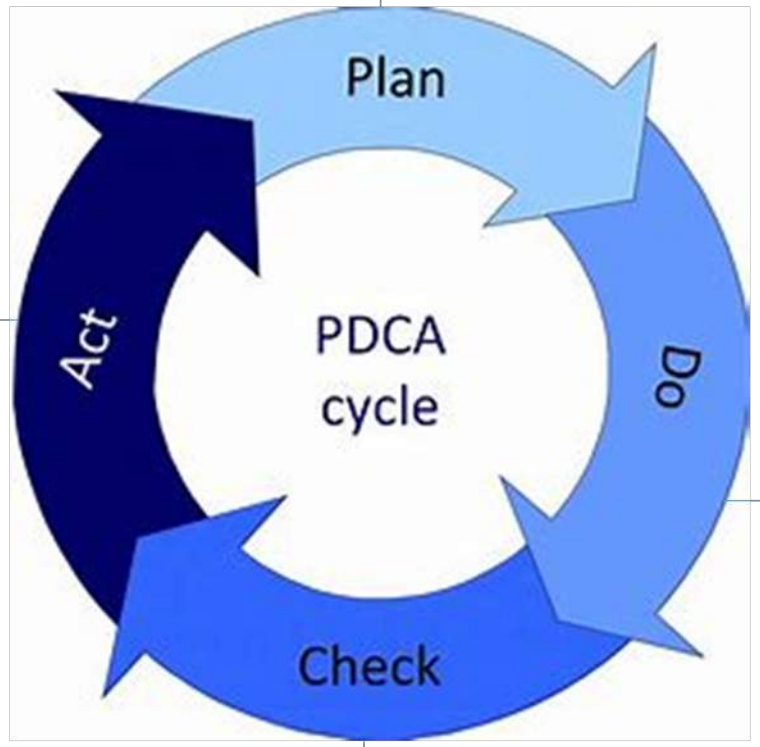
— **Check**: monitor and (where applicable) measure processes and the resulting products and services against policies, objectives, requirements and planned activities, and report the results;

— **Act**: take actions to improve performance, as necessary.



Management system to support the implementation of CENELEC Standard

Make a assessment
"The treatment operator shall possess infrastructure, in terms of size, technologies installed, and characteristics of the operations, that is suitable for the activities performed on site"
Right resources (including human resources);
Tools (SOP's).



Implement and make records

Evaluate the results;
Internal audits;
Management Reviews

Correct non conformities;
Implement corrective actions.

Policy for quality, environment and health, safety

A Policy is statement of the organization, describes the intentions and direction of the organization as formally expressed by its top management.

The policy should:

- give a commitment to the organization satisfying applicable requirements, such as customer or statutory and regulatory requirements;
- give a commitment to continual improvement of management system.

How to define a policy for quality, environment and health, safety

Ensure that the policy is communicated, understood and applied by persons in the organization so they are able to contribute to the effectiveness of the management system, and that it is available to relevant interested parties.

In order to maintain a policy, the organization should review it periodically to determine if it is still appropriate to the purpose of the organization. This could be done, for example, once a year or as part of the management review process

The policy can be communicated by different methods such as via noticeboards, screensavers, by the organization's website, or during routine meetings.

Procedures and records to support the management system;

Mainly a management system to answer the requirements, should include:

- **Standard Operational Procedures or instructions (PLAN):**
  - Assess the legal requirements not only related to the necessary permits but also the legal requirements related with Environmental and Health and Safety
  - Procedures or instructions related with the WEEE treatment must included responsibilities
  - Procedures related with training
  - Procedures about internal audits
  - Procedures about emergency procedures
  - Procedures or protocols about sampling
  - Procedure about mass balance and recovery and recycling rates
  - Risk assessment and control of measures defined to protect the workers
  - Management documentation (downstream monitoring, licence and permits, insurances, ….

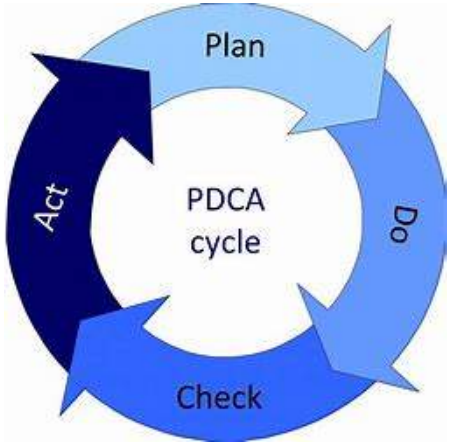
Procedures and records to support the management system

- **Records that show the fulfil (DO):**
  - legal requirements;
  - Training
  - Records of audits (internal or external)
  - Batch test
  - Transportation documents (including TFS movement forms; annex VII forms, waste transfer notes etc.), records of the incoming WEEE, packaging labels, storage plans.
  - information on the first acceptors, declarations from first acceptors, information on the downstream acceptors, …).
  - Mass Balance
  - All the records that result of the operation

Procedures and records to support the management system

- **CHECK:**
  - System of performance indicators (KPI's)
  - Records of audits (internal or external)
  - records related with environmental monitoring (like: emissions monitoring from chimney, analysis related with discharge water, noise measurement and others)
  - Mass Balance
  - Calculation of recycling and recovery rates
  - Report analysis

- **ACT**
  - Solving non conformities or problems (records)



Collection, logistics & Treatment requirements for WEEE
Part 1: General treatment requirements

	Clause of EN 50625-1:2014 (referred as "EN“)
General and Legal compliance and document management	EN (4.1; 5.10; 6)
Documents and downstream monitoring	EN (4.4; 4.5; 5.2; 5.10; 6; Annex C and D)
Material reception, sorting, handling and storage	EN (4.2; 5.1; 5.3; 5.4; 5.5; 5.8)
Training, facility safety and emergency planning	EN (4.2; 4.3; 6)
Depollution	EN (5.1; 5.4; 5.5; 5.7; 6; Annex A and F)
Depollution monitoring	EN (5.5; 5.7) – General EN (5.6) - De-pollution monitoring – streams EN (5.6; 6; Annex B) - Depollution process and batches

Collection, logistics & Treatment requirements for WEEE Part 1: General treatment requirements

	Clause of EN 50625-1:2014 (referred as "EN“)
Batch tests and Recycling & Recovery rates	EN (5.9; 5.10; 6; Annex D) - Batch tests EN (5.9; 5.10, 6; Annex C) - Recycling & recovery achievements
Preparation for re-use	EN (4.2; 5.3)

Contents

Training

Training of employees takes place after orientation takes place. Training is the process of enhancing the skills, capabilities and knowledge of employees for doing a particular job. Training process moulds the thinking of employees and leads to quality performance of employees. It is continuous and never ending in nature.

Training is given on four basic grounds:

- New candidates who join an organization are given training. This training familiarize them with the organizational mission, vision, rules and regulations and the working conditions.
- The existing employees are trained to refresh and enhance their knowledge.
- If any updating and amendments take place in technology, training is given to cope up with those changes. When promotion and career growth becomes important. Training is given so that employees are prepared to share the responsibilities of the higher level job.

Training

In the CENELEC standard is defined that the operator needs to demonstrate that employees and contractors working at the treatment facility are provided with appropriate training and information in their own language, regarding tasks they have to perform, including for emergency response planning, occupational health and safety measures.

Related with the operations:

Work instructions and procedures.

Training

QES:

Environmental, Health and Safety Policy and Procedures;

Emergency response planning, occupational health and safety measures, and training for the relevant operations performed on site;

Risk assessments, safety statements

Records, work permits (for restricted / confined areas; at height, etc.)

emergency response planning, occupational health and safety measures, and training for the relevant operations performed on site

Contractors environmental, health and safety guidance document.

Among others…

Internal Audits

The role of internal audit is to provide assurance that an organisation's internal control processes are operating effectively.

To have a objective view, it is advise to have an independent view from the operations that is

To be effective, the internal audit must be conducted by someone that is qualified, skilled and have experience in accordance with the operations and the standard.

The principal objective/result of an internal audit is:

Identify Non-Conformances and Areas for Improvement

Continuous improvement

Continuous improvement (*4.1 and 6)* (and regular updates) of the activities related to all treatment processes must be demonstrated.

HOW ?

- Minutes of meetings related with the analysis of subjects related with WEEE (non conformities and actions taken to improve;
- relevant Key Performance Indicators (KPI).
- Monitoring data and reports
- Records showing better DE-POLLUTION; Higher RECYCLING AND RECOVERY rates; better control of the DOWNSTREAM routes; Improvement of the SAFETY AND EMERGENCY preparedness; better STORAGE AND HANDLING practices

Risk Assessment and Understand the potential risk in WEEE

A risk assessment is a systematic examination of your workplace to:

1) identify significant hazards;

2) assess injury severity and likelihood;

and

3) implement control measures to reduce workplace risks

Beyond complying with legislative requirements, the purpose of risk assessments are to improve the overall health and safety of your workers.

How to Perform a Risk Assessment?

Risk assessments should be carried out by competent persons who are experienced in assessing hazard injury severity, likelihood and control measures. A new risk assessment should be carried out when there are new machines, substances and procedures which could lead to new hazards. They should be reviewed regularly and kept up to date.

Here are 5 steps to follow when performing a risk assessment in your workplace:

1. **Identify hazards:** Survey the workplace and look at what could reasonably be expected to cause harm. Review previous accident and near-miss reports.
2. **Decide who might be harmed and how**: Identify which group and demographic of workers might be harmed. Ask workers if they can think of anyone else who could be harmed by the hazard.

How to Perform a Risk Assessment?

3. **Evaluate the risks and decide on control measures:** Look for existing controls in place. Follow the hierarchy of controls in prioritizing implementation of controls.
4. **Record your findings and implement them:** Use a risk assessment template to document your findings.
5. **Review your assessment and update if necessary:** Follow up with your assessments to check if controls have been put in place or if any new hazards have resulted

Examples of hazardous substances:

- Cathode ray tubes (Fluorescent coating, Lead glass) – risk for the Water and Soil and for human Health
- Printed circuit boards – risk for the Water and Soil
- Capacitors – risk for the Water and Soil and for human Health (PCB's)
- Plastic containing brominated flame retardants – risk when incorrectly recycled; risk for the Atmosphere when incorrectly burned

Display units: CRT

Examples of hazardous substances:

- VFC (Freons) – risk for the Atmosphere
- VHC (Pentane/Isobutane) – Explosion risk
- Oil – risk for the Water and Soil
- Mercury containing switches – risk for Health & Safety and Atmosphere
- Printed circuit boards – risk for the Water and Soil
- Capacitors – risk for the Water and Soil and for human Health (PCB's)

Temperature exchange equipment

Examples of hazardous substances:

- Printed circuit boards – risk for the Water and Soil
- Capacitors – risk for the Water and Soil and for human Health (PCB's)
- Oil – risk for the Water and Soil (e.g. in oil containing radiators)
- Asbestos – risk for human Health
- VFC (Freons) / HC (Pentane) – risk for the Atmosphere, Explosion risk (in the hot water boilers/heaters)

Large Household Appliances

&

Examples of hazardous substances:

- Printed circuit boards – risk for the Water and Soil
- Capacitors – risk for the Water and Soil and for huma
  Health (PCB's)
- Asbestos – risk for human Health
- Batteries and accumulators – risk for the Water and S
  and for human Health
- Toner cartridges – risk for the Water and Soil
- Plastic containing brominated flame retardants – risk
  when incorrectly recycled; risk for the Atmosphere w
  incorrectly burned
- Radioactive substances – risk for human Health

Small / Mixed appliances

Examples of hazardous substances:

- Mercury containing backlighting lamps – risk for human Health
- Printed circuit boards – risk for the Water and Soil
- Capacitors – risk for the Water and Soil and for human Health (PCB's)
- Plastic containing brominated flame retardants – risk when incorrectly recycled; risk for the Atmosphere when incorrectly burned

Display units: FPD

picture o f a laptop

Hazardous substances:

- Mercury – risk for human Health and Air

Gas discharge lamps

Examples of hazardous substances:

- Lead, cadmium, selenium – risk for the Water, Soil and human Health
- Printed circuit boards – risk for the Water and Soil
- Capacitors – risk for the Water and Soil and for human Health (PCB's)
- Plastic containing brominated flame retardants – risk when incorrectly recycled; risk for the Atmosphere when incorrectly burned

Photovoltaic panels

Cathode ray tubes (Fluorescent coating, Lead glass)

The glass of a typical colour CRT can contain 75 to 90 % of lead oxide. (funnel and neck section).

The screen typically contains very little lead but instead contains barium, strontium and zirconium oxides. The inside of screen is first covered with a graphite coating and then the fluorescent coatings. These coatings can be composed of zinc, cadmium and yttrium sulphides and copper or silver chloride, and may even contain arsenic.

The black and withe CRTs are also hazardous and should be deal with in the same manor as colour CRT’s.

LEAD

Working with lead can put your health at risk, causing symptoms including headaches, stomach pains and anaemia. Other serious health effects include kidney damage, nerve and brain damage and infertility.

Normally, regulation sets out that the employer must ensure that the exposure of employees to lead by any route (eg inhalation, ingestion, absorption through the skin or contact with the skin) is either prevented or, where this is not reasonably practicable, adequately controlled. In meeting these requirements, the employer should consider and adopt the best practical measures for achieving the overall protection of employees' health.

Where prevention of exposure to lead is not reasonably practicable, employers must control exposure.

Capacitors containing polychlorinated biphenyls (PCBs)

Historically PCBs were used extensively in electrical equipment such as capacitors and transformers. However, their use in open applications was widely banned in 1972 and they have not been used in the manufacture of new equipment since 1986. Plants that had been installed prior to 1986 were allowed to continue until the end of their working life. Thus it should be assumed that capacitors manufactured before 1976 contain PCBs. However, unless an appliance is more that 20 years old the chance that it contains capacitors containing PCBs is very remote

Mercury containing components such as switches or back-lighting

Mercury is used in fluorescent lamps, medical equipment, data transmission, telecommunications and mobile phones. Its use in electrical and electronic equipment has declined significantly in recent years and its use is banned (save certain exempt uses) from 2006. Apart from batteries, most other mercury containing items are likely to be found on a circuit board. Thus removing the circuit board would result in removal of most mercury containing competent such as switches.

Increasing numbers of non-CRT flat panel screens (such as liquid crystal display (LCD), laptop and desk top monitors and plasma screens) are entering the waste stream and requiring specialist treatment.

Refrigerants and Ammonia

Cooling appliances containing refrigerants (fridges and freezers) – most refrigerators reaching the waste stream are between 10 and 15 years old and are therefore likely to contain Ozone Depleting Substances (ODS) (e.g. CFCs and HCFCs). Units manufactured after 1994 are unlikely to contain CFCs.

Fridges and freezers identified as containing ammonia must have their ammonia extracted and transferred to a suitable container pending disposal. As well as presenting a fire and explosion risk, ammonia is potentially hazardous to both the environment and human health.

Toner cartridges, liquid and paste, as well as colour toner

Toner cartridges, liquid and paste, as well as colour toner – commonly found in printers, fax machines and photocopiers. These should be removed whole and intact so as to prevent the dispersal of toner and then stored in suitable labelled containers.

Volatile organic compound are present in Toner cartridges. High concern with styrene (cancer).

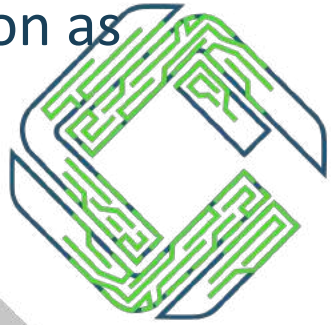
Asbestos waste and components which contain asbestos

Asbestos has been used in older appliances such as electric coffee pots, toasters and irons. Asbestos was also a component of some electric heaters and other items that benefited from the heat resistant properties of the material. Modern appliances are not permitted to contain asbestos; however, operators of treatment facilities need to be vigilant for items which might contain asbestos. Appliances that are over 20 years old might contain asbestos and therefore should be examined carefully and treated accordingly.

What are the risks?

Asbestos can be harmful if dust containing the fibre is inhaled.

The risk from asbestos where the fibres are still intact (such as in asbestos cement) is significantly reduced. However, always treat all asbestos products with caution as potential sources of fibrous dust, and handle them carefully.



Components containing refractory ceramic fibres (RCFs)

Mainly used in furnace/heater/kiln linings. Respirable RCFs are classified as category 2 carcinogen. Although RCFs may be used in both domestic appliances and building heating appliances, the insulation material used in domestic electrical appliances are more likely to contain components based on mineral wools rather than RCFs.

Appliances which might contain RCFs must be examined to determine if they contain RCFs and appropriate controls put in place before they are removed.

The fibres themselves can irritate the skin, eyes and upper respiratory tract but the main concern is that the individual fibres are small enough to penetrate deep into the lungs and possibly lead to the development of lung cancer and mesothelioma.

Components containing radioactive substances

Components containing radioactive substances – can be found in a variety of equipment in many commercial settings (e.g. fill level detectors, static eliminators, radium luminised dials, old trim phones) as well as smoke detectors.

What are the basic measures in radiation protection?

Shortening the time of exposure, increasing distance from a radiation source and shielding are the basic countermeasures (or protective measures) to reduce doses from external exposure.

Time: The less time that people are exposed to a radiation source, the less the absorbed dose.

Distance: The farther away that people are from a radiation source, the less the absorbed dose.

Shielding: Barriers of lead, concrete or water can stop radiation or reduce radiation intensity.

Main Technical and infrastructural characteristics of the treatment facilities

- The treatment operator shall possess **infrastructure**, in terms of size, technologies installed, and characteristics of the operations , that is suitable for the activities performed on site.

- Suitability of the site shall be assessed by a **risk management process** for all tasks performed on site and include the identification of hazards, the **assessment of risk** and, where appropriate, the **elimination or reduction of the risk**, and documentation of the process.

- This risk assessment shall include the identification of those locations and activities that require the **use of personal protective equipment and procedures** to be followed.

Main Technical and infrastructural characteristics of the treatment facilities

- Treatment facilities including storage areas shall be designed, organised, and maintained to provide **safe access to, and egress from, the site**. Treatment facilities including storage areas shall be secured to **prevent access by unauthorized persons, to prevent damage to and theft** of WEEE and components.

What is important in terms of Technical and infrastructural characteristics of the treatment facilities

- **Infrastructure suitable**

- Equipment, machines and facilities are in a good condition and safe to use
- Treatment facility designed, organized, and maintained to provide safe access to and egress from the site
- Controlled access to the site by gate / Gatekeepers
- Signs / Rules for visitors and subcontractors
- Visitors, truck drivers, contractors are accompanied when having access to the site
- Fences, walls, well maintained and sufficiently high

What is important in terms of Technical and infrastructural characteristics of the treatment facilities

- **Infrastructure suitable and safe to use**

Appropriate areas - weatherproof covering. **Weatherproof covering** shall be required for the areas where:

- whole equipment and / or components, intended for **preparation for re-use** are stored and/or prepared for re- use, or;
- WEEE and fractions thereof that can cause **emissions that are hazardous** to the environment is stored and/or treated

What is important in terms of Technical and infrastructural characteristics of the treatment facilities

- **Infrastructure suitable**

Weatherproof covering for the following types of WEEE;

- **gas discharge lamps** and equipment containing gas discharge lamps,
- **CRT** equipment,
- **flat panel** displays and flat panel display equipment.

What is important in terms of Technical and infrastructural characteristics of the treatment facilities

- **The operators must have and respect the risk assessment to addresses all the WEEE related operations**

- Risk assessment up-to-date and covering all activities
- Provisions of the Risk assessment respected (measures to reduce the risk implemented)
- Suitable Personal protective equipment provided and used by workers

- **Emergency plan**

- Updated and covering all activities and locations

Receiving, handling and storage of WEEE prior to treatment

- **Receiving of WEEE at treatment facility**

- weigh and record each delivery that is received at the facility;
- separate the WEEE from the non-WEEE; and
- weigh and record that part which is WEEE.

Receiving, handling and storage of WEEE prior to treatment

- **Handling of WEEE**

- **All handling** of WEEE, including the loading, unloading and transport, shall be carried out using **appropriate tools, containers and fixings to avoid damage** where there is the potential for preparation for re-use or the risk of hazardous substances being emitted.

- **Uncontrolled tipping** of containers with **CRT** equipment, **flat panel display** equipment, **temperature exchange** equipment, and **gas discharge lamps** and equipment containing gas discharge lamps **shall not be permitted**.

Receiving, handling and storage of WEEE prior to treatment

- **Storage of WEEE**
- Locations that **store WEEE prior to treatment** shall have:

➢ **impermeable surfaces** to prevent ground water and soil contamination;

➢ the provision of **spillage collection facilities** relevant to the type of WEEE stored;

➢ where appropriate, **decanters and cleanser -degreasers**; and

➢ **weatherproof covering for appropriate areas** (see 4.2), so there are no emissions which give rise to an adverse environmental impact.

Receiving, handling and storage of WEEE prior to treatment

- **Storage of WEEE**
- **store WEEE prior to treatment**:

Where **containers are used for storage of equipment and fractions, and these have led to pollutant dispersion**, the affected containers **shall be cleaned and decontaminated prior to their re -use, recycling or disposal**.

Storage of WEEE prior to treatment

Good practice	Bad practice
• Separate zones for each treatment group	• Mountains of WEEE
• Impermeable surfacing in all storage areas and clean drains – all in good condition!	• Surface is bare earth / gravel – drains are blocked with rubbish, mud or leaves etc.
• Weatherproof covering *(or stored indoors)*	• Surface water / flooded areas
• Oil/Water separator and Spillage kits available – with correct contents *(absorbent materials and shovels; …)*	• Storage racks / containers in poor condition

Shipment and Waste Shipment Regulations

No treatment operator shall initiate or contribute to shipments of WEEE, or fractions thereof, which would result in **treatment that is not in compliance with the Cenelec standard**.

- *NOTE 1 Regulatory requirements for cross border shipments, including monitoring , are covered in Regulation 1013/2006/EC and Article 10 of Directive 2012/ 19 /EU.*

- *NOTE 2 Council Directive 2006/117/EURATOM defines requirements for the supervision and control of shipments of radioactive waste between Member States and into and out of the Community.*

Shipment and Waste Shipment Regulations

- **All directly exported fractions shall be correctly shipped in line with the Waste Shipment Regulations**

- Transfrontier shipment permits (TFS) and application documents (including annexes)
- Annex VII forms
- Export records and documents

- **All exports shall be in line with Basel Convention obligations.**

- **The treatment performed outside must be complied with the Cenelec standard requirements**

- Evidence of a proper treatment process outside

Documentation

- The treatment operator **shall maintain the following**:

➢ records demonstrating **compliance with legal and regulatory obligations** applying to all activities undertaken on site;

➢ **process diagrams** with information on each **treatment step** carried out by the treatment operator and the resulting fractions;

➢ internal administrative procedures and documentation relating to **management reviews** and related **improvement processes** according to 4.1 and in particular, **results of internal controls and depollution monitoring** (see Annex B);

➢ internal administration procedures and documentation relating to the **destruction** during the treatment of WEEE of **confidential and personal data** stored in the permanent memory, according to 5.1;

Documentation

- The treatment operator **shall maintain the following**:

➢ records concerning **health, safety, and environmental monitoring** including records of maintenance of site and servicing of machinery according to 4.2;

➢ records concerning **training of employees and instructions/guidance** regarding treatment processes including manual dismantling according to 4.3;

➢ records of **cleaning and decontamination of containers** used for storing fractions containing hazardous substances according to 5.4;

➢ results from **batch processes** performed according to Annex D ; and

➢ documents that record **downstream monitoring of each fraction** according to 4.4 and records describing the **determination of recycling and recovery rates** prepared in accordance with Annex C. An **overview** of the documentation required is given in **Annex G**.

Documentation

- The treatment operator **shall maintain the following**:

➢ documents from the **preparation for reuse** according to section,

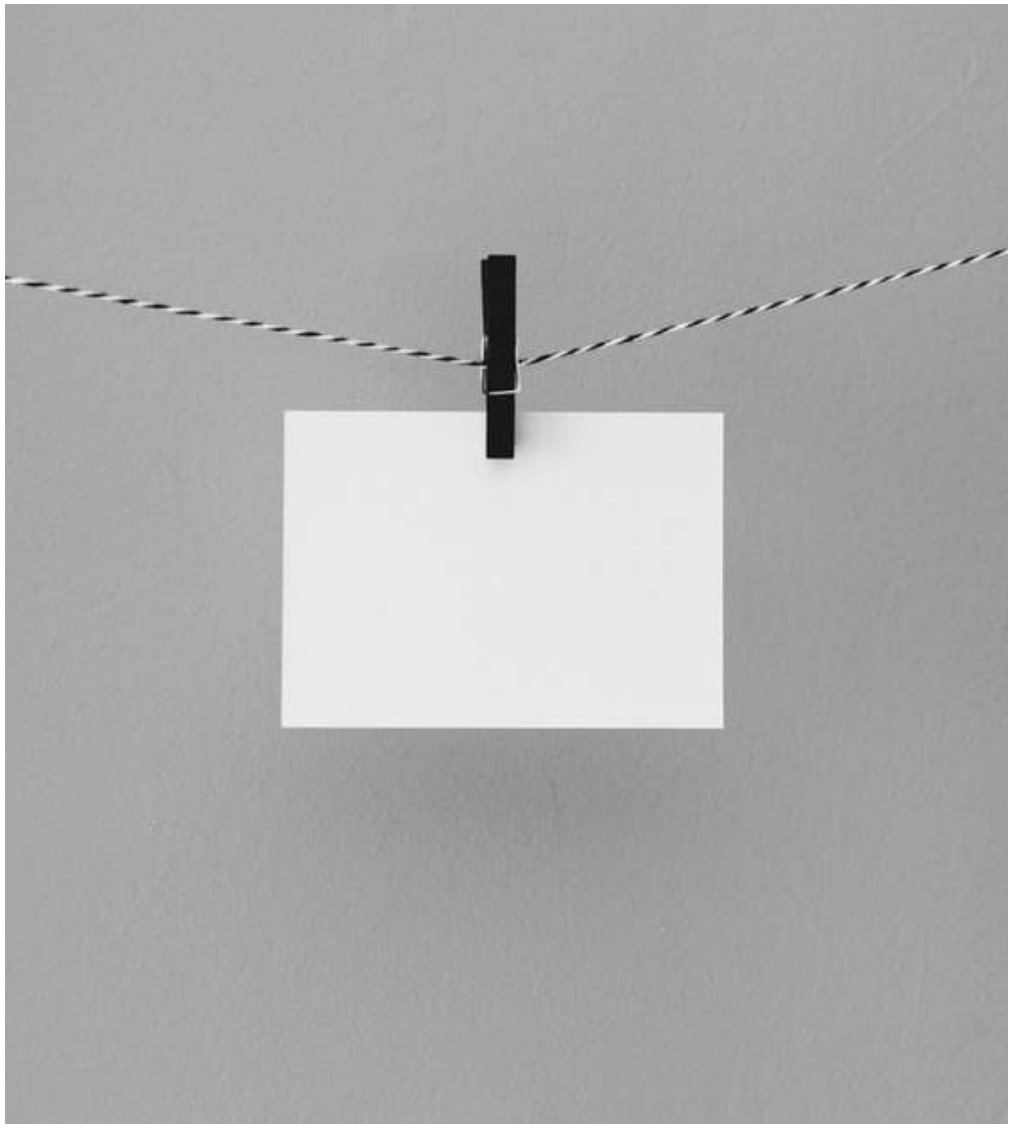
➢ **first aid measures and emergency plans** including records of **insurance or financial resources**

➢ records of **maintenance** of site and servicing of machinery.

Documentation

- The treatment operator shall **maintain records of each mass balance conducted**.
- Each **mass balance calculation shall be supported by documentation of all material flow** (summaries of incoming and outgoing deliveries and all stored quantities of WEEE and WEEE fractions).
- An **overall mass balance** describing the material flow through the facility shall be prepared **at least on an annual basis**; information about individual mass balance calculations, if any, shall be accumulated to provide an annualised mass balance.

All **batch documents shall be stored securely for a period of five years**, with **other documents stored securely for a period of three years**



Time for Questions


THANK YOU

ANNEX D: WEBINAR ON EN 50625 STANDARDS – COLLECTION & LOGISTICS, TECHNICAL REQUIREMENTS

CEWASTE

Training Webinar

Part IV: WEEELABEX/EN50625 II: Collection & logistics, technical requirements

Paula Costa, Development Manager

WEEELABEX Organisation

WEEELABEX
CONFORMITY & VERIFICATION

sofies
leading sustainability

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Welcome

Introduction

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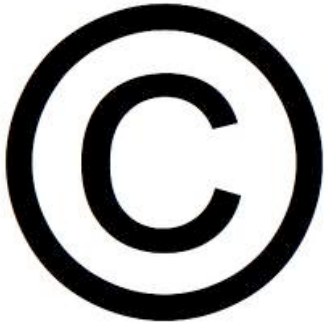
Outline

3. Collection and logistics
   - Material acceptance, handling, storage and sorting
4. Technical requirements during Operations
   - Handling
   - De-pollution
   - How to measure De-pollution monitoring
   - Treatment of non-de-polluted WEEE and fractions
   - Storage of fractions
   - Recovery and disposal of fractions

INTRODUCTION



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Collection and logistics

CENELEC Standard for C&L

- TS 50625-4: Collection, logistics & treatment requirements for WEEE -- Part 4: Specification for the collection and logistics associated with WEEE

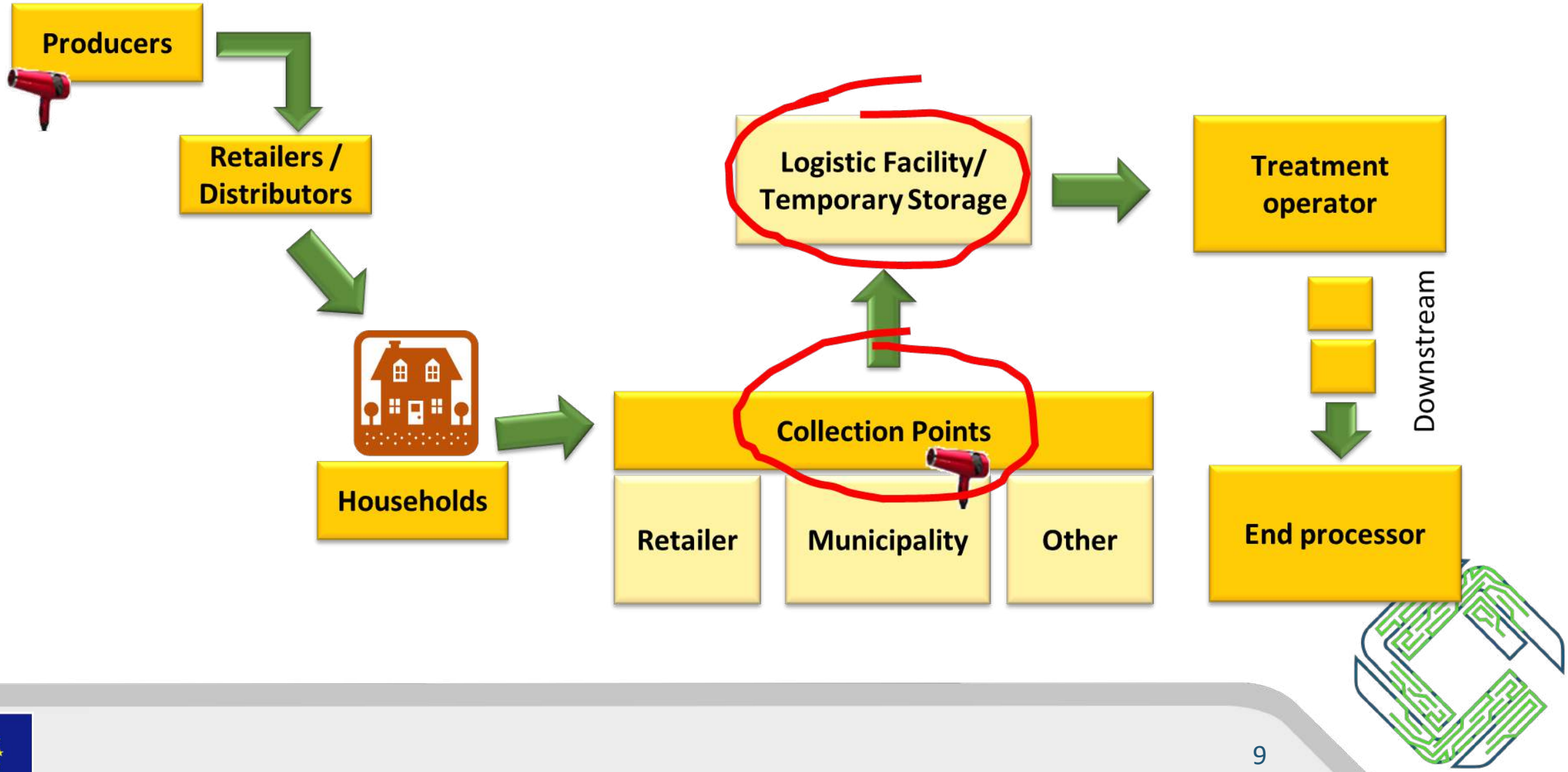
CENELEC current situation and future development

WEEELABEX
CONFORMITY & VERIFICATION

Calculated dates for deciding on document revisions

Row Labels	Date of Availabilty	Decide on document updating
GEN		
EN 50625-1 General	March, 2014	March, 2019
TS 50625-3-1 General	January, 2015	January, 2018
LAMP		
EN 50625-2-1 Lamps	December, 2014	December, 2019
TS 50625-3-2 Lamps	May, 2016	May, 2019
CRT FPD		
EN 50625-2-2 CRT FPD	May, 2015	May, 2020
TS 50625-3-3 CRT FPD	August, 2017	August, 2020
TEMP		
EN 50625-2-3 Temp. Exchange	July, 2017	July, 2022
TS 50625-3-4 Temp. Exchange	July, 2017	July, 2020
PV		
EN 50625-2-4 PV	November, 2017	November, 2022
TS 50625-3-5 PV	November, 2017	November, 2020
CL		
TS 50625-4 Col. & Log.	June, 2017	June, 2020
FIN		
TS 50625-5 Final processing	August, 2017	August, 2020
TR		
TR 50625-6 Technical Report	June, 2018	

C&L


Producers
Retailers / Distributors
Households
Logistic Facility/ Temporary Storage
Collection Points
Retailer
Municipality
Other
Treatment operator
Downstream
End processor

Legal obligations & Authorisations: not applicable to Collection point;

Management system: not applicable to Collection point;

Technical and infrastructural pre-conditions: not applicable to Collection point;

(facility designed, organized, and maintained to provide safe access to and egress from the site; access by unauthorized persons;
Monitoring: not applicable to Collection point;

(documents showing the downstream chain up to the preparing for re-use operator or treatment operator for the WEEE leaving the facility)

But … WEEE received at the Collection or Logistic facility transferred to operators that work according to or towards the EN 50625 series and or EN 50614 is applicable to all

- **Documentation**
  Check the certification of the acceptors of WEEE or the documentation that may prove the acceptors are working towards EN 50625-series. Outgoing transfer notes. WEEE inventory, input/ output. Facilities' licenses and permits. WEEELABEX Operators list on the WEEELABEX website.

- The Collection or Logistics facility or Collection point must record the downstream destination of the WEEE up to the first treatment operator or preparing for re-use operator, the latter must work in compliance or towards the EN50625 series on treatment requirements or 50614 on re-use (this requirement remains also in case when the WEEE is managed via a broker)

C&L

Documentation (cont…)

- **The following downstream monitoring requirements shall apply:**

a) if the downstream treatment or re-use operator is CENELEC certified, any other downstream information or documentation shall not be necessary;

b) if the downstream treatment operator is not CENELEC certified, the downstream information and documents shall contain at least:

▪ copies of legal authorization and transportation documents;

▪ results from a batch test(s) for all managed streams (the batch test(s) shall be performed according to the EN 50625-1, Annex D);

▪ results from a special performance test for temperature exchange equipment stream (the special performance test shall be performed according to the EN 50625-2-3 and CLC/TS 50625-3-4);

▪ results of de-pollution monitoring as defined in the relevant Technical Specifications (CLC/TS 50625-3-1, CLC/TS 50625-3-2, CLC/TS 50625-3-3, CLC/TS 50625-3-4, CLC/TS 50625-3-5);

▪ records declaring determination and achieving of Re-use, Recycling and Recovery targets for each WEEE stream; and

▪ documents that record downstream monitoring of each fraction (an overview of the downstream documentation required is given in the WEEELABEX document B 04 WEEELABEX Guidance Document that is relevant for WEEE treatment operators)

C&L

Documentation (cont…)

- **The following downstream monitoring requirements shall apply:**

c) if the downstream re-use operator is not CENELEC certified, the downstream information and documents shall contain at least:

▪ copies of legal authorization and transportation documents;

▪ accredited certificate of compliance with EN 50614 issued by an independent third party

C&L

Documentation (cont…)

There may be different case scenarios depending on which party decides the destination of the WEEE collected:

A. The collection facility, logistics facility or collection point decides the destination of the WEEE collected:

▪ In such case, the collection facility, logistics facility or collection point shall provide the downstream monitoring information and documentation as defined above.

B. An external company decides the destination of the WEEE collected (e.g. logistics operator, Extended Producer Responsibility scheme):

▪ In such case, the party that decides the destination of the WEEE collected shall provide the downstream monitoring information and documentation as defined above.

Please note that the downstream monitoring requirements defined in this clause are not essential for achieving the WEEELABEX attestation of conformity.

Evidence may be provided by the intermediate party, for example a collective scheme or a trader.

Management requirements for collection points

The entity responsible for the collection must supply the collection point with appropriate information of the potential risks related to the collection of WEEE.
This information must be accessible at collection points (must cover basic knowledge about the re-use of EEE, WEEE, the potential for preparing for re-use, its hazardous nature, its handling and transport)

The collection point operator must be familiar with the information and ensures that WEEE is handled accordingly

C&L

Material acceptance, handling, storage and sorting

WEEE is not mixed with other types of waste: applicable to all;

WEEE received sorted at least into the following groups: temperature exchange equipment, CRT equipment, flat panel display equipment, lamps, photovoltaic panels and small equipment as referred to in categories 5 and 6 of Annex III (Directive 2012/19/EU): **not applicable to Collection point**

Acceptance: not applicable to Collection point

Handling: applicable to all

(WEEE must be handled with due care, in order to avoid release of hazardous substances into air, water or soil and/or damage)

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Material acceptance, handling, storage and sorting

Storage: not applicable to Collection point

(storage areas for WEEE must have impermeable surfaces and a spillage collection facility; weatherproof covering for storage areas for WEEE or fractions thereof that can cause emissions that are hazardous to the environment)

Applicable for the Collection point: correct storage of CRT equipment, flat panel display equipment, temperature exchange equipment, PV panels and lamps so as to prevent them from being damaged

C&L

Trainning: not applicable to Collection point;

Emergency planning: not applicable to Collection point;

Facility Safety: not applicable to Collection point;

(documented risk assessment)

Transport not applicable to Collection point;

WEEE suitable for preparing for re-use: not applicable to Collection point;

Material acceptance, handling, storage and sorting

Material acceptance

	Collection points	Collection facilities	Logistics facility
WEEE cannot be mixed with other types of waste	X	X	X
WEEE received need to be sorted at least into the following groups: temperature exchange equipment, CRT equipment, flat panel display equipment, lamps, photovoltaic panels and small equipment as referred to in categories 5 and 6 of Annex III (Directive 2012/19/EU)?		X	X
Must be enough space for appropriate storage of received WEEE		X	X
Must exist clear, visible and appropriate signage to direct public users to the relevant containers		X	

How to check?

Check the description of the waste expedited in the transfer notes refers to WEEE separated.
Check containers available on site and information on the content.
Check subsequent separation process at a later stage if WEEE is not separated at the audited facilities, this can be done via a declaration provided by the downstream acceptor of the waste.

Assess how effective the sorting process is.

Check the storage areas.

Check the sorting procedures. Interview the employees.

Check legal and regulatory requirements and compare with the site visit (quantities).
Check Verify access policy, check the visitor logs

Handling

	Collection points	Collection facilities	Logistics facility
WEEE must be handled with due care, in order to avoid release of hazardous substances into air, water or soil and/or damage.	X	X	X
It is not allowed to crush or compact WEEE during the reception, handling, and loading of the WEEE received	X	X	X
Lamps must be removed and placed in appropriate containers to avoid damage or breakage of the lamps	X	X	X
It is not allowed to do any form of depollution treatment or removal of components during the handling	X	X	X
Tipping of containers containing with WEEE on arrival or during storage is not allowed		X	X

How to check?

On the site tour special attention to CRT equipment, flat panel display equipment, PV panels, temperature exchange equipment, lamps containing mercury, and any equipment containing asbestos.

Verify the handling and storage procedure – check formal procedures and do interviews.

Try to witness unloading processes of incoming WEEE and evaluate.

Check storage areas and see if there is stacking in inappropriate height or methods.

For C&F Equipment's check if the CFA are not crushed, compacted, or handled in a way that could damage any part of the refrigerating system or the insulating foam.

Lithium batteries check if there is special measures in place: avoid exposure to heat, humidity, sunlight, water or any crushing or physical damage to Li batteries.

Uncontrolled tipping of containers with temperature exchange equipment shall not be undertaken.

Storage

	Collection points	Collection facilities	Logistics facility
Impermeable surfaces and a spillage collection facility		X	X
weatherproof covering for storage areas for WEEE or fractions that can cause emissions that are hazardous to the environment		X	X
Assure correct storage of CRT equipment, flat panel display equipment, temperature exchange equipment, PV panels and lamps so as to prevent them from being damaged	X	X	X

How to check?

Examples:

Visit on site. Check all areas that may be affected by rain have a spillage collection facility with closed drainage system.
Check if the storage surfaces are in good conditions.

Check if there are spillages, and what are the controls implemented.

Check that lamps are stored separately from other WEEE under weatherproof conditions and damage or breakage of the lamps is avoided
Check that batteries removed or loose are stored in adequate closed containers under weatherproof covering
Check that any broken equipment that can cause dispersion (by rain, wind etc.) of hazardous substances (in the form of leachate, dust, fibres etc.) is stored under weatherproof covering.

Sorting

	Collection points	Collection facilities	Logistics facility
gas discharge lamps and LED lamps shall be collected together	X	X	X

How to check?

On site tour check containers.

Do interviews to the staff to verify if they are familiar with the procedure and understand the reasoning, risks and impacts behind.

Technical requirements during Operations

Technical requirements during Operations

- Handling
- De-pollution
- How to measure De-pollution monitoring
- Treatment of non-de-polluted WEEE and fractions
- Storage of fractions
- Recovery and disposal of fractions

Handling

Handling

What is the main purpose of the part HANDLING?

WEEE shall be handled and stored with **due care in order to avoid release of hazardous substances into air, water, or soil**, as a result of damage and/or leakage.

NOTE 1 Handling includes loading and unloading.

Handling

Special focus

During handling and storage attention shall be given but not limited to:

- **TEMPERATURE EXCHANGE EQUIPMENT** (to avoid **damage to the temperature Exchange system**);
- **CRT EQUIPMENT** (to avoid **implosion and / or emissions of fluorescent coatings**);
- **GAS DISCHARGE LAMPS**, appliances containing gas discharge lamps and appliances containing mercury switches (to avoid breakage resulting in the **release of mercury**);
- **SMOKE DETECTORS** (as they may contain **radioactive components);**
- **APPLIANCES CONTAINING OIL AND OTHER FLUIDS** within an internal circuit, or capacitors containing mineral or synthetic oil (to **avoid spillages and other emissions**);
- **APPLIANCES CONTAINING ASBESTOS OR CERAMIC FIBRES** (to **avoid release of asbestos or ceramic fibres**); and
- **PHOTOVOLTAIC PANELS** (to prevent **injury from broken glass and electrocution** caused through contact with hazardous voltages generated when the panels are exposed to light) .

Handling

All handling of WEEE, including the loading, unloading and transport, shall be carried out using **appropriate tools, containers and fixings to avoid damage** where there is the potential for preparation for re-use or the risk of hazardous substances being emitted.

Uncontrolled tipping of containers with **CRT** equipment, **flat panel display** equipment, **temperature exchange** equipment, and **gas discharge lamps** and equipment containing gas discharge lamps **shall not be permitted**.

Quite a weak system in old fridges

Handling

WEEE **shall not be handled** in a way that subsequent **preparation for re -use, de-pollution or recovery is adversely affected**.

CRT equipment, flat panel display equipment, temperature exchange equipment, and gas discharge lamps **shall be placed in containers or stacked in a stable manner to prevent damage or breakage**.

De-pollution

De-pollution

Substances and preparations that need to be removed:

- Capacitors (PCB, eletrolytic and oil containing)
- Components containing Hg
- Batteries and accumulators
- Printed circuit boards
- Toner cartridges
- Plastics with Brominated flame retardants
- Asbestos

De-pollution

Substances and preparations that need to be removed:

- Cathode ray tubes
- Volatile Fluorocarbons and Volatile Hydrocarbons (CFC, HCFC, HFC and HC)
- Gas discharge lamps
- Liquid crystal displays
- External electric cables
- Components containing refractory ceramic fibres
- Components containing radioactive substances

De-pollution

- Removal practices should avoid:
- Damage of components
- Release of hazardous substances

- ICT equipment: personal data should be destroyed

- Ban on dilution

- No mixing of removed substances.

- Labeling.

De-pollution

Substances, mixtures and components shall be removed such that they are contained as an identifiable stream or identifiable part of a stream by the end of the treatment process.

A substance , mixture or component is identifiable if it can be monitored to prove environmentally safe treatment.

De-pollution of substance , mixture or component can be removed:

1. **as a distinct step during the treatment process and prior to size reduction and separation** unless the treatment technology captures the materials and components identified in Annex F of the standard in an identifiable stream such that it is not released to the environment.

1. **as an identifiable (part of a) stream during the treatment process.**

De-pollution

Examples of 1	Examples of 2
➢ capacitors containing polychlorinated biphenyls (PCB) , cathode ray tubes, ➢ gas discharge lamps, ➢ volatile fluorocarbons, volatile hydrocarbons contained in a refrigerant system, ➢ batteries which are accessible in the equipment without using tools, ➢ toner cartridges; ➢ and components containing asbestos, mercury, refractory ceramic fibres, and radioactive substances	➢ batteries which are not accessible in the equipment without using tools, ➢ Printed circuit boards, ➢ plastics containing brominated flame retardants, ➢ volatile fluorocarbons and volatile hydrocarbons other than those contained in a refrigerant system, ➢ liquid crystal displays, ➢ external electric cables and ➢ electrolyte capacitors (> 25 mm or proportionately similar volume) containing substances of concern.

De-pollution

How to treat WEEE in case of doubts?

If it is uncertain whether WEEE contains substances, mixtures or components as listed in Annex F, it shall be treated as though it does contain those substances, mixtures or components.

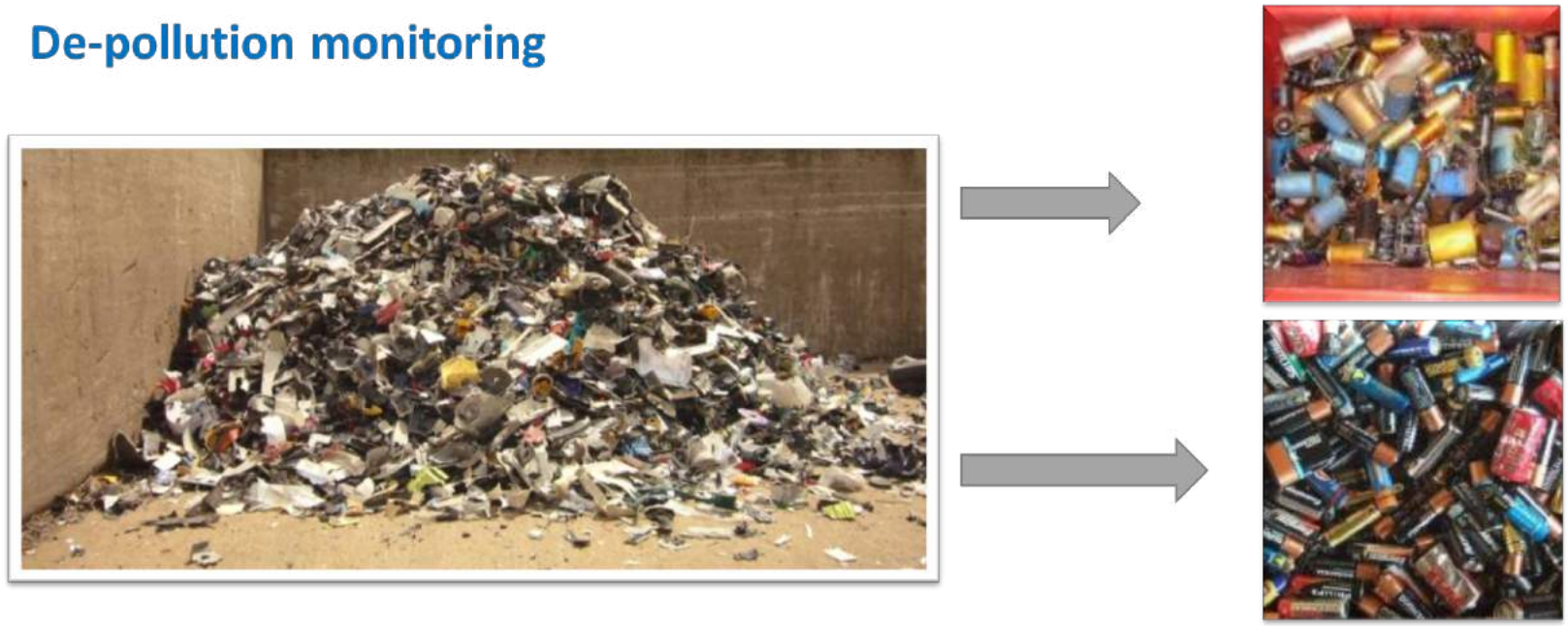
Examples of where WEEE could need to be treated as if it contains substances, mixtures or components as listed in Annex F include:

- capacitors that could contain polychlorinated biphenyls (PCB),
- plastics parts that could contain brominated flame retardants, or
- products covered by more specific treatment standards, such as temperature exchange equipment, flat panel display equipment, CRT equipment and lamps.

How to measure De-pollution monitoring

De-pollution monitoring

Monitoring of de-pollution performance is an important criterion to facilitate **continuous improvement** of the treatment process.



How to check that all the hazardous components are removed?

De-pollution monitoring

Where appropriate treatment operators shall carry out monitoring of de-pollution performance in accordance with one or more of the following appropriate methodologies using a systematic approach which documents each step of the process:

a) target value methodology - compare a measurement of the mass of de-polluted fractions in the outgoing stream with the corresponding target value, or;
b) mass -balance methodology - establish a mass balance between incoming and outgoing streams, or;
c) analysis methodology - analysis of representative samples from relevant fractions that result from the treatment of WEEE.

De-pollution monitoring

The CENELEC standard **CLC/TS 50625-3-1** specifies the following information and requirements:

- The overview of applicable methodologies for each specific treatment stream;
- Description of the methodologies;
- Benchmarks, target values and limit values;
- Sampling methods and analytical methods;
- Other technical specifications related to the de-pollution monitoring.

De-pollution monitoring

Benchmarking: *Batch results are compared with a benchmark system*

Example: LHA batch test

Capacitors

Batteries

How is it possible to monitor the quality of de-pollution?

By comparison with **TARGET VALUES** defined in **CLC/TS 50625-3-1**

De-pollution monitoring

***Mass Balance**: A mass balance which compares the incoming and outgoing streams.*

Example: CFA specialist test

- % CFC recovered from cooling circuits
- CFC recovered from insulating foam
- CFC in oil and polyurethane

How is it possible to monitor the quality of de-pollution?

By comparison with **TARGET and LIMIT VALUES** defined in **EN 50574-1** and **CLC/TS 50574-2**

De-pollution monitoring

Output fractions analyses *of representative samples.*

Example: Shredder Light Fraction

mg/kg PCB

mg/kg Cd

How is it possible to monitor and control the quality of de-pollution?

Chemical analysis - comparison with **LIMIT VALUES** defined in **CLC/TS 50625-3-1**

De-pollution monitoring

Applicability of the three methodologies

WEEE treatment process flow	Target value methodology	Mass Balance methodology	Analysis methodology
Large appliances	Applicable to capacitors	Not applicable	Applicable for the PCB in the physically smallest non-metallic mechanical treatment fraction (see A.1)
Cooling and freezing appliances	Applicable to capacitors	Applicable (EN 50574-1 and CLC/TS 50574-2)	Applicable (EN 50574-1 and CLC/TS 50574-2)
CRT display appliances	Applicable to capacitors	Not applicable	Applicable for BFRs in plastics fractions Applicable (TS for CRT/FPD)
FPD appliances	Not applicable	Specific TS for CRT/FPD	Applicable for BFRs in plastics fractions. Applicable (TS for CRT/FPD)
Gas discharge lamps	Not applicable	Not applicable	Applicable (CLC/TS 50625-3-2)
Small appliances	Applicable to capacitors and batteries	Not applicable	Applicable for the PCB and cadmium in the physically smallest non-metallic mechanical treatment fraction (see A.1) and BFRs in plastics fractions

De-pollution monitoring

Where can be found the target and limit values?

In the CLC/TS 50625-3-1 Collection, logistics & treatment requirements for WEEE - Part 3-1: Specification for de- pollution – General

and in Technical Specifications for:

- **Temperature exchange equipment,**
- **CRT display appliances,**
- **FPD appliances,**
- **Gas discharge lamps, and**
- **Photovoltaic Panels**

Treatment of non-de-polluted WEEE and fractions

Treatment of non-de-polluted WEEE and fractions

If **non de-polluted WEEE and fractions** are treated by a downstream treatment operator, this treatment **operator shall be informed** in accompanying documents of the **potential presence of hazardous material**.

The **downstream treatment operator shall be informed** of the **need for the non-depolluted WEEE or fractions to be depolluted** in compliance with the objectives of this standard regardless of the hazardous or non-hazardous nature.

Storage of fractions

OUTPUT FRACTIONS:

Storage of fractions to avoid:

- dispersal of hazardous substances to the environment
- harm to workers and other people

Storage of fractions

All fractions containing **hazardous substances** shall be stored in a manner that **prevents dispersal of the hazardous material to the environment**.

Storage of fractions

Weatherproof covering shall be provided for storage locations for:

- capacitors covered by A.2,
- mercury containing components,
- batteries,
- printed circuit boards,
- toner cartridges,
- asbestos and components which contain asbestos,
- cathode ray tubes,
- gas discharge lamps,
- components containing refractory ceramic fibres and
- components containing radioactive substances.

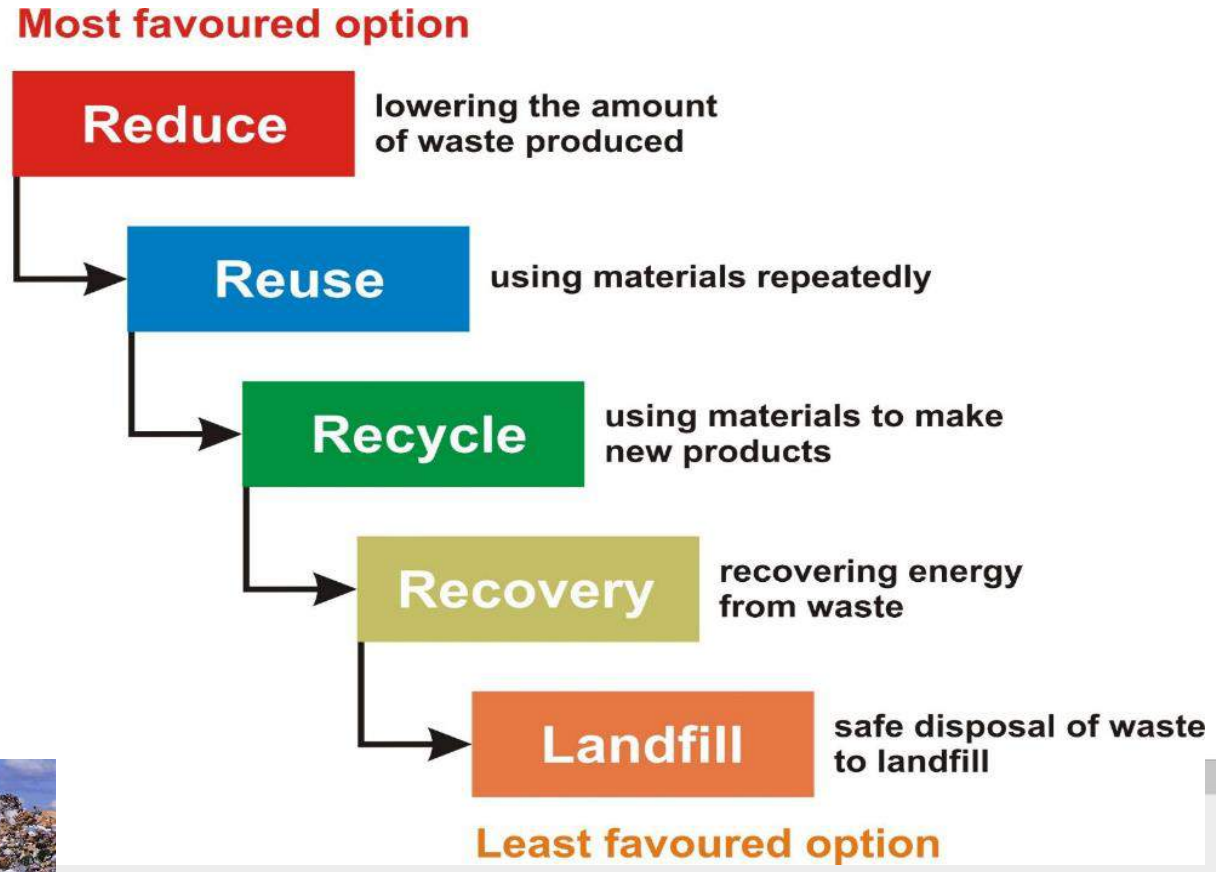
Storage of fractions

Containers used for the **storage** of fractions containing **hazardous substances** shall be **cleaned and decontaminated** prior to their **re-use, recycling or disposal**.

Recovery and disposal of fractions

Recovery and disposal of fractions

Fractions resulting from the WEEE treatment process can have reached end-of-waste status, or they can be sent for recycling, recovery, or disposal. The **principles of the waste hierarchy** shall be adhered to.



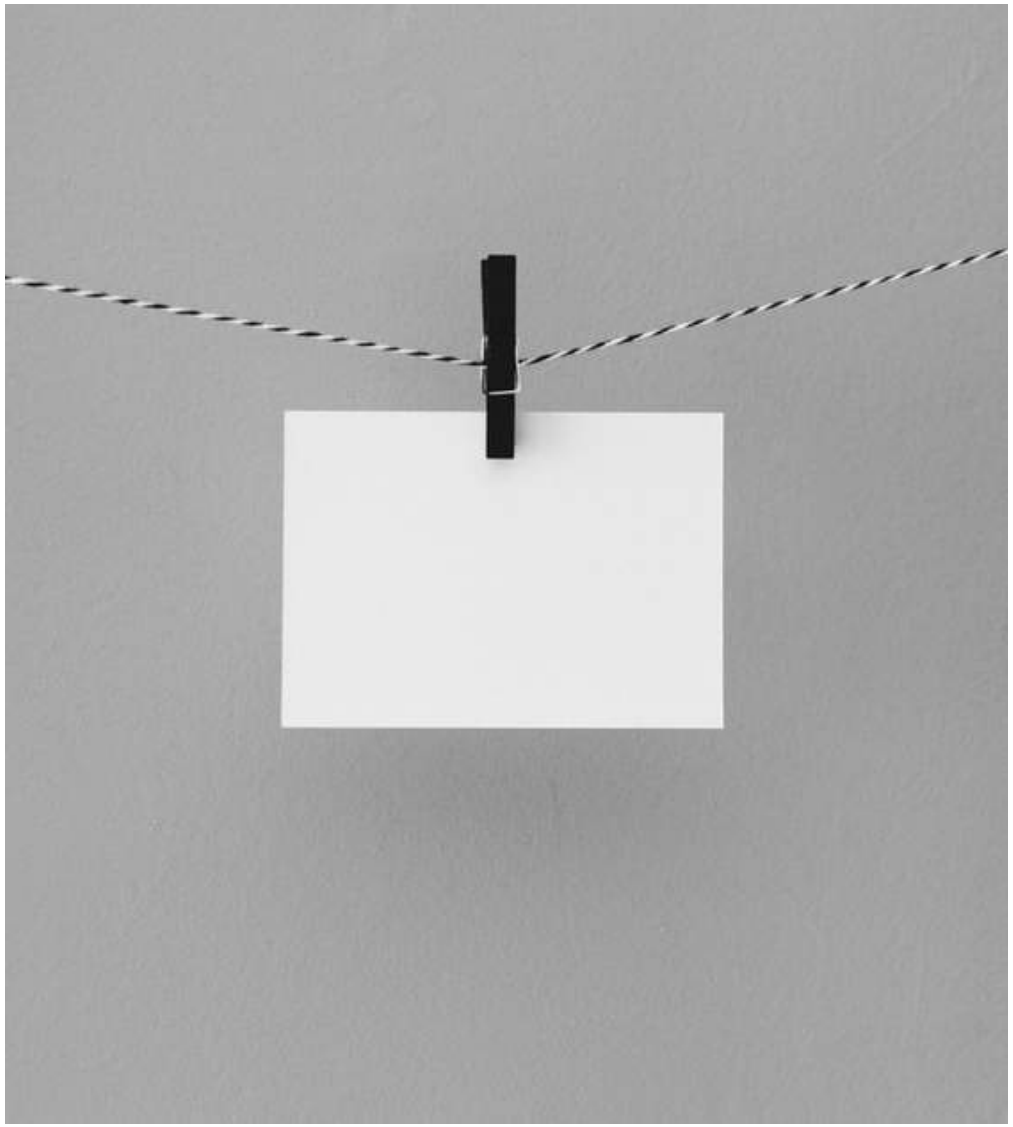
Recovery and disposal of fractions

Hazardous waste that is designated for disposal shall only **go to a facility that is designed and designated for the acceptance and disposal of hazardous waste**.

Hazardous substances or preparations shall, **prior to landfill disposal**, either be **broken down into non-hazardous substances, or be immobilized, or properly managed** such that the hazardous substances, mixtures or components **cannot be released into the environment**.

Recovery and disposal of fractions

Materials **containing mercury, halogenated compounds, and beryllium shall not be destroyed by incineration, waste to energy or be disposed of in landfill** except if the law mandates these methods of disposal, or prohibits their use in electrical and electronic equipment sold after 31 December 2012.



Time for Questions


THANK YOU