
Draft Project plan for the CEN Workshop TREASURE on “A methodology to improve the recyclability rate of Critical Raw Materials from cars”

Requests to participate in the Workshop and/or comments on the project plan are to be submitted by 27 November 2023 to mario.gallo@uni.com¹

Recipients of this project plan are kindly requested to name all patent rights known to them to be relevant to the Workshop and to make available all supporting documents.

Milan, 2023.10.06 (version 1)

¹ Applications for participating in the Workshop and comments on the project plan that are not received by the deadline do not need to be taken into consideration. Once constituted, the Workshop will decide whether or not to consider the comments received in good time.

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1 Status of the project plan

Draft project plan for public commenting (Version 1.0)

This draft project plan is intended to inform the public of a new Workshop. Any interested party can take part in this Workshop and/or comment on this draft project plan. Please send any requests to participate or comments by e-mail to mario.gallo@uni.com

All those who have applied for participation or have commented on the project plan by the deadline will be invited to the kick-off meeting of the Workshop on **2023-12-13**.

2 Workshop proposer and Workshop participants

2.1 Workshop proposer

<u>Person or organisation</u>	<u>Short description and interest in the subject</u>
Paolo Rosa – Politecnico di Milano	<p>Politecnico di Milano is a public scientific-technological university which trains engineers, architects and industrial designers.</p> <p>The University has always focused on the quality and innovation of its teaching and research, developing a fruitful relationship with business and productive world by means of experimental research and technological transfer.</p>

2.2 Other potential participants

This CWA will be developed in a Workshop (temporary body) that is open to any interested party. The participation of other experts would be helpful and is desired. It is recommended that:

- car parts suppliers
- car makers
- car dismantlers and shredders
- academic and research
- research institutes
- standards application
- government
- non-governmental organization (NGOs)

take part in the development of this CWA.

2.3 Participants at the kick-off meeting

All [Treasure project partner](#) (15 organizations from 7 European countries) will be invited to actively participate to the kick-off meeting prior to the publication of the draft project plan. The list of participants is not yet fully finalized. It will be available after the kick off meeting

2.4 Registered Workshop participants

All Treasure project partners will be invited to actively participate in the development of the CWA.

The following persons or organizations have expressed an interest to be involved as Workshop participants at the kick-off meeting and to actively participate in the development of the CWA:

<u>Person</u>	<u>Organisation</u>
Paolo Rosa – Workshop Chairperson	Politecnico di Milano (Treasure project)
Abel Ortego – Workshop Vice-Chairperson	University of Zaragoza (Treasure Project)
Antoinette Van Schaik – Workshop Project Leader	MARAS (Treasure Project)
Mario Gallo	UNI - Workshop secretariat

3 Workshop objectives and scope

The overall goal of the Workshop is developing a pre-standard (CWA) related to 1) the identification of Critical Raw Materials (CRMs) embedded in car electronics and 2) the information sharing among all the actors involved (for several reasons and with different roles) in automotive supply chains. The origin of the proposed activity is the H2020 TREASURE project (www.treasureproject.eu), GA 101003587. The objective of TREASURE is making automotive supply chains (with a specific focus in car electronics) more circular through the adoption of digital tools and improving the awareness of the different actors toward the presence of CRMs in specific car components.

3.1 Background

The TREASURE Workshop is driven by the need to address challenges in the automotive electronics sector, where car electronics are of significant value as sources of Critical Raw Materials (CRMs) [1],[2]. On average, modern cars contain up to 15 electronic systems, while luxury vehicles can have 50 or more, comprising microcomputers and components [3]. These electronics have a substantial impact on the sector's economy, often accounting for over 30% of a vehicle's cost, rising to over 50% for luxury cars [4]. Despite the growth of the sector, car manufacturers and the whole automotive industry have been reluctant to recover these valuable components from End-of-Life Vehicles (ELVs).

This reluctance is due to a complex web of barriers, including regulatory, governance, market, and technological challenges, which are preventing the full adoption of Circular Economy (CE) principles and unveiling that a sectorial transition is far from being completed, despite significant

investment in sustainable mobility approaches. In particular, the End-of-Life (EoL) phase poses specific challenges, preventing material recovery and the consequent reduction of natural resource dependence. This systemic transformation requires a fundamental redesign of product lifecycles, integrating CE principles from the outset.

However, barriers within the automotive sector and a lack of collaboration among stakeholders pose significant obstacles to this transition. The disconnection between Beginning-of-Life (BoL) and EoL stages, with data locked in protected databases, hinders the optimization of ELV processes. Furthermore, a reluctance to share knowledge hinders design improvements for easier disassembly and recycling.

In this context, the TREASURE Workshop aims at providing a comprehensive and standardized framework for the recovery of electronic components from ELVs, with a specific focus on CRMs, and for the interconnection of actors along the automotive value chain, leveraging innovative technologies to overcome historical industry limitations and propelling the automotive sector towards circularity.

ELVs represent a significant source of secondary raw materials, with annual volumes estimated at 7 to 14 million tons in Europe alone [5]. Carmakers have already been proactive in reusing approximately 70% of ELV materials to manufacture new vehicles [6]. Various international directives and national laws have been introduced to promote sustainable practices, such as the European Directive 2000/53/EC. The latest update of this directive sets a target of 95% recovery of the average mass of a generic ELV, with provisions for energy valorization and material recycling. The mass-based assessment approach of the regulation has mainly improved the recovery of basic materials, such as steel, aluminium, plastic, and glass. However, this does not incentivize the recovery of minor, but extremely valuable elements, such as rare earths (REE), precious metals, and other essential raw materials used in the manufacture of electric and electronic equipment, due to their low mass percentage within ELVs.

The ELV recovery process involves removing hazardous components, dismantling and potentially reusing valuable parts, and shredding the remaining hull into small scraps. Ferrous metals (about 65% of the average mass) are directly reintroduced into the automotive supply chain. Non-metals, approximately 25% of the average mass known as Automotive Shredder Residue (ASR), are often landfilled or used for energy generation. Non-ferrous metals (about 5% of the average mass) may become impurities in other fractions. Despite recovery efforts, the process relies on outdated technologies.

Although experts have proposed innovative procedures [7], the primary focus remains on improving recovery rates, especially for ASR. This limits the application of circular economy principles as it primarily targets materials contained in high percentages within ELVs.

The development and application of innovative and physics and industry based recycling simulation models in TREASURE (on the background of work over years on this topic) allows to both quantify industrial achievable recycling performance in detail for each different product design, disassembly approach etc and provides insights into optimisation and knowhow for Design for Recycling. This industry relevant, simulation based rigorous assessment of recyclability of products and parts on a industrial and rigorous basis is providing insight into recyclability of parts and products, achievable total recycling rates as well as individual material recycling rates and energy balances over recycling processing. This provides insights in how recycling can be optimised by application of modular recycling (through additional disassembly), optimal organisation and selection of recycling processes for the product/part and disassembled components from it and Design for Recycling and can at the same time provide insight into ambitious as well realistic and technologically feasible recycling target definition in regulation.

3.2 Scope

The planned CEN Workshop Agreement defines a method to support all the automotive actors in identifying the presence of CRMs in car electronics and disassembling/separating/recycling these components in a proper way. The final aim is improving the recyclability rate of CRMs from cars, create a market for secondary CRMs and reuse CRMs in new high-value applications (possibly within the automotive sector).

The planned CEN Workshop Agreement is intended to be used by car makers car parts manufactures or suppliers and End-of-Life Vehicle (ELV) managers (e.g. car dismantlers and/or car shredders). This document can support the policy makers in the development of a future digital product passport specific for printed circuit boards (PCBs) and is based on the experience and results developed within TREASURE project. This activity is coherent with the new version of ELV Regulation in development.

Finally, the procedure could be adoptable by other sectors where the presence of electronics is relevant and CRM can be recycled and reused.

3.3 Related activities

The subject of the planned CWA is not at present the subject of a standard. However, there are committees, standards and/or other technical specifications that deal with related subjects and thus need to be taken into account and involved, where necessary during this Workshop:

- CEN/TC 301 Road vehicles

Treasure project has already been in touch with the Italian TC mirroring CEN/TC 301.

4 Workshop programme

4.1 General

The kick-off meeting is planned to take place on **13 December 2023**. A draft for public commenting will be published for 30 days.

The CWA will be drawn up in English (language of meetings, minutes, etc.). The CWA will be written in English.

The CWA will be available for free download, according to the conditions of CEN/CENELEC Guide 10.

4.2 Workshop schedule

CEN/CENELEC Workshop	M01 (September 2023)	M02	M03	M04	M05	M06	M07	M08	M09	M10	...
Initiation											
1. Proposal form submission and TC response											
2. Project plan development											
3. Open commenting											
Operation											
4. Kick-off meeting											
5. CWA(s) development											
7. CWA(s) finalised and											
Publication											
8. CWA(s) publication											
Dissemination (see 7)											
Milestones				K	V	V				V/ M /A	P D

Table 1: Workshop schedule (preliminary)

B CEN/CENELEC BT meeting deciding on establishment of a CEN/CENELEC Workshop

K Kick-off

M Workshop meeting

V Virtual Workshop meeting

A Adoption of CWA

P Publication of CWA

D Online distribution of CWA

5 Resource planning

The administrative costs of CEN Workshop Secretariat will be covered by resources from the H2020 project Treasure GA no. 101003587.

6 Workshop structure and rules of cooperation

6.1 Participation in the Workshop

The workshop will be led by a chair or vice-chair, while the project leader will support them in the organization.

The CEN Workshop Chair is responsible for ensuring that the development of the CWA follows the principles and content of the adopted project plan and the requirements of the CEN Guide 29. The CEN Workshop Chair may take decisions on the conduct of the CEN Workshop on the basis of the comments expressed by the participants according to the CWA rules.

The workshop secretariat is responsible for the organization and management of the workshops according to the CEN Guide 29.

CEN Workshop participants draft the CWA and take in consideration the comments after the public commenting phase (if this is foreseen in the development of the CWA). CEN Workshop participants are the CWA proposers (the members of TREASURE project), plus other relevant stakeholder, identified by the proposer.

6.2 Workshop responsibilities

The Workshop Chair is responsible for content management and any decision-making and voting procedures. The Workshop Chair is supported by the Workshop Vice-Chair and the responsible Workshop secretariat, whereby the Workshop secretariat will always remain neutral regarding the content of the CWA(s). Furthermore, the Workshop secretariat shall ensure that CEN rules of procedure, rules of presentation, and the principles governing the publication of CWA(s) have been observed. Should a Workshop Chair no longer be able to carry out her/his duties, the Workshop secretariat shall initiate the election of a new Workshop Chair. The list below covers the main tasks of the Workshop Chair. It is not intended to be exhaustive.

- Content related contact point for the Workshop,
- Presides at Workshop meetings,
- Ensures that the development of the CWA respects the principles and content of the adopted project plan,
- Manages the consensus building process, decides when the Workshop participants have reached agreement on the final CWA, on the basis of the comments received,
- Ensures due information exchange with the Workshop secretariat,
- Represents the Workshop and its results to exterior.

The Workshop secretariat, provided by a CEN national member, is responsible for organising and leading the kick-off meeting, in consultation with the Workshop proposer. Further Workshop meetings and/or web conferences shall be organised by the Workshop secretariat in consultation with the Workshop Chair. The list below covers the main tasks of the Workshop secretariat. It is not intended to be exhaustive.

- Administrative and organisational contact point for the Workshop,
- Ensures that the development of the CWA respects the principles and content of the adopted project plan and of the requirements of the CEN-CENELEC Guide 29,
- Formally registers Workshop participants and maintains record of participating organisations and individuals,
- Offers infrastructure and manage documents and their distribution through an electronic platform,
- Prepares agenda and distribute information on meetings and meeting minutes as well as follow-up actions of the Workshop,
- Initiates and manage CWA approval process upon decision by the Workshop Chair,
- Interface with CEN and Workshop Chair regarding strategic directions, problems arising, and external relationships,

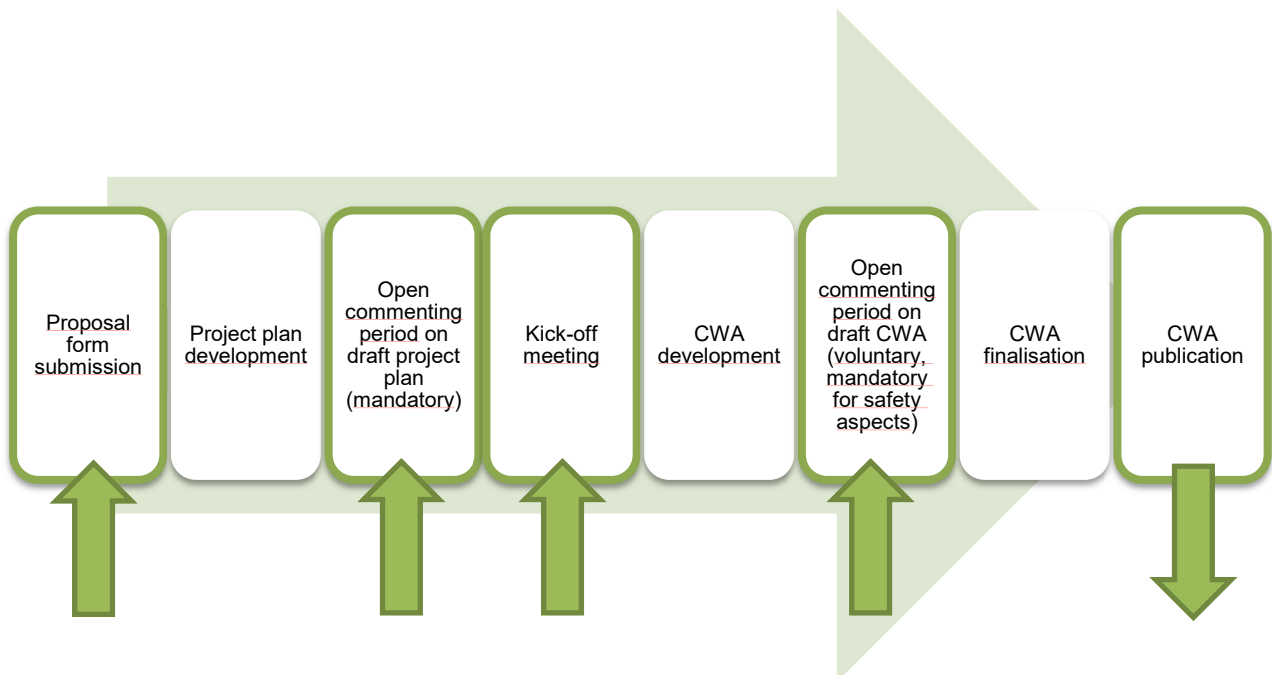
- Advises on CEN rules and bring any major problems encountered (if any) in the development of the CWA to the attention of CEN,
- Administrates the connection with relevant CEN.

6.3 Decision making process

Each Workshop participant is entitled to vote and has one vote. If an organization sends several experts to the Workshop, that organization has only one vote, regardless of how many Workshop participants it sends. Transferring voting rights to other Workshop participants is not permitted. During voting procedures, decisions are passed by simple majority; abstentions do not count.

If Workshop participants cannot be present in the meetings when the CWA or its draft is adopted, an alternative means of including them in the voting procedure shall be used.

7 Dissemination and participation strategy



Proposal form submission

The Workshop proposal will be disseminated to the following relevant stakeholders and bodies for consultation:

- standards committee, working group etc.
- others (TREASURE sister projects)

Open commenting period on draft project plan

The project plan will be disseminated to the following relevant stakeholders and bodies for commenting:

- standards committee, working group etc.
- others (TREASURE sister projects)

In addition to the CCMC website, the project plan and the date of the kick-off meeting will be advertised on the TREASURE website (<https://www.treasureproject.eu/>) to raise awareness. Interested parties are requested to contribute either through commenting of the project plan (short term) or through Workshop participation (long term).

CWA publication

The final CWA will be disseminated to the following relevant stakeholders and bodies:

- standards committee, working group etc.
- others (TREASURE sister projects)

In addition to the CCMC website, the final CWA will be advertised on:

- sector specific newsletter
- social media, such as
 - Facebook
 - Instagram
 - LinkedIn
 - Twitter
- Research Gate
- EC Newsroom
- Others

8 Contacts

- Workshop Chair:

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