TREASURE

D9.2: Advisory Board report

31/05/2024 (M36)

Authors: Paolo Rosa (POLIMI)

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Technical References

Project Acronym	TREASURE
Project Title	leading the TRansition of the European Automotive SUpply chain towards a circulaR future
Project Coordinator	POLITECNICO DI MILANO (POLIMI)
Project Duration	36 months as of 1 June 2021

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VF		

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[1] PU= Public
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EXECUTIVE SUMMARY

The report outlines the activities carried by the Advisory Board – a body of experts that provides guidance on how to enhance the impact of the PPP – during the whole duration of the TREASURE project. More precisely, after introducing the current Advisory Board composition and communication tools, a summary of the input of the Advisory Board members during the meetings held from 2021 to 2024 will be presented.

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1. Introduction

As of June 2021, the TREASURE Advisory Board was composed of 6 members representative of the automotive & e-waste management community. However, the TREASURE consortium decided to continue the enrolment of AB members till reaching 10 members. The next tables show the evolution of the distribution of the AB members during the whole project duration.

1.1. List of Advisory Board members

An updated list of AB members is reported in the following tables:

Table 1. List of AB members (as in June 2021)

Name	Surname	Expertise	Institution	Country
Xianlai	Zeng	WEEE management	Tsinghua University	CHN
Julien	Van Damme	Automotive environ. Impacts	JVD Consulting	BEL
Callie	Babbit	WEEE management	Rochester Institute of Technology	USA
Gabrielle	Gaustad	WEEE management	Alfred University	USA
Ornella	Cilona	Automotive standards	UNI/CT-38	ITA
Luca	Campadello	WEEE management	ERION WEEE	ITA

Table 2. List of AB members (as in December 2021)

Name	Surname	Expertise	Institution	Country
Xianlai	Zeng	WEEE management	Tsinghua University	CHN
Julien	Van Damme	WEEE management	JVD Consulting	BEL
Callie	Babbit	Automotive environ. Impacts	Rochester Institute of Technology	USA
Gabrielle	Gaustad	WEEE management	Alfred University	USA
Ornella	Cilona	WEEE management	UNI/CT-38	ITA
Luca	Campadello	Automotive standards	ERION WEEE	ITA
Aaron	Cabrera	Metal inks	Mateprincs	SPA

Table 3. List of AB members (as in June 2022)

Name	Surname	Expertise	Institution	Country
Xianlai	Zeng	WEEE management	Tsinghua University	CHN
Julien	Van Damme	WEEE management	JVD Consulting	BEL
Callie	Babbit	Automotive environ. Impacts	Rochester Institute of Technology	USA
Gabrielle	Gaustad	WEEE management	Alfred University	USA
Ornella	Cilona	WEEE management	UNI/CT-38	ITA
Luca	Campadello	Automotive standards	ERION WEEE	ITA
Aaron	Cabrera	Metal inks	Centro Stirling	SPA
Benjamin	Dhuiege	Metal inks	GENESINK SA	FRA

Table 4. List of AB members (as in March 2023)

Name	Surname	Expertise	Institution	Country
Xianlai	Zeng	WEEE management	Tsinghua University	CHN
Julien	Van Damme	WEEE management	JVD Consulting	BEL
Callie	Babbit	Automotive environ. Impacts	Rochester Institute of Technology	USA
Gabrielle	Gaustad	WEEE management	Alfred University	USA
Ornella	Cilona	WEEE management	UNI/CT-38	ITA
Luca	Campadello	Automotive standards	ERION WEEE	ITA

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Aaron	Cabrera	Metal inks	Centro Stirling	SPA
Benjamin	Dhuiege	Metal inks	GENESINK SA	FRA
Christoph	Bontenackels	Plastic substrates	Covestro Group	GER
Gian Maurizio	Rodella	Automotive standards	CUNA	ITA

Table 5. List of AB members (as in February 2024)

Name	Surname	Expertise	Institution	Country
Xianlai	Zeng	WEEE management	Tsinghua University	CHN
Julien	Van Damme	WEEE management	JVD Consulting	BEL
Callie	Babbit	Automotive environ. Impacts	Rochester Institute of Technology	USA
Gabrielle	Gaustad	WEEE management	Alfred University	USA
Ornella	Cilona	WEEE management	UNI/CT-38	ITA
Luca	Campadello	Automotive standards	ERION WEEE	ITA
Aaron	Cabrera	Metal inks	Centro Stirling	SPA
Idriss	Hisham	Metal inks	GENESINK SA	FRA
Christoph	Bontenackels	Plastic substrates	Covestro Group	GER
Gian Maurizio	Rodella	Automotive standards	CUNA	ITA
Manuele	Capelli	Sustainable mobility	EMPA	CH

2. Communication infrastructure

On top of standard email exchanges, all members of the Advisory Board have been periodically invited to general assemblies (one time/year) and received regular updates of all activities of the TREASURE community. Trying to cope with recommendations received from the reviewers and the Project Officer, after the first review meeting AB members have been invited to all the topics meetings (one time/month) in order to be informed about the last updates of the TREASURE project and check the final version of the different modules constituting the TREASURE platform.

3. Activities timeline

Table 6. Advisory Board involvement (overview)

June-July 2021	December 2021	June 2022	March 2023	November 2023	February-May 2024
1st Recruitment process	1st GA with AB members	2nd GA with AB members	3rd GA with AB members	TREASURE special session @ RMW 2023	Monthly topics meetings with AB members

3.1. Recruitment process

Between June and July 2021, Advisory Board members have been recruited through the following procedure:

- Selection process driven by the TREASURE consortium to nominate 6 candidates
- Initial contact by mail to the candidates by the person who provided the contact
- Organization of a meeting to explain the TREASURE ecosystem and the role of the advisory board and financial conditions
- On acceptance, formal invitation letter and request for biographical data and consent on the utilization of these data

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By end of July 2021, 6 persons accepted to be member of the TREASURE Advisory Board.

3.2. 1st General Assembly with Advisory Board members

The 1st General Assembly with the presence of the TREASURE Advisory Board was held on the 22nd of December 2021 (14:00 – 17:00). The goal of this meeting was for all members to get to know each other, learning about the context surrounding the TREASURE projects and share their initial thoughts about TREASURE.

Agenda:

14:00	Welcome (POLIMI)
14:05	Project partners short introduction, project introduction and vision (POLIMI)
14:40	Advisory Board (AB) short introduction (roundtable) Short introduction of each AB member (name of the institution, introduction of persons involved in the project and field of expertise) – approx. 2 minute per AB member

14:50	Storytelling of past and ongoing activities – Part 1
	Power Point Presentation of each WP and Task leaders (general overview and ongoing activities) – approx. 20 minutes per WP
	• WP1 – Overview of the reference framework, use cases description and macro-level platform requirements
	  ○ **AB perspective on WP1** - Discussion about the reference framework, selected use cases and platform requirements
	• WP2 – Overview of circularity & sustainability assessment methods under evaluation
	  ○ **AB perspective on WP2** - Discussion about alternative assessment methods from WEEE/ELV sectors and social impacts of WEEE/ELV management practices
	• WP3 – Overview of SEAT car models/car parts selection
	  ○ **AB perspective on WP3** - Discussion about current data management practices in WEEE and ELV sectors

15:50	Coffee Break

16:00	Storytelling of past and ongoing activities – Part 2
	Power Point Presentation of each WP and Task leaders (general overview and ongoing activities) – approx. 20 minutes per WP
	• WP5 – Overview of PCB recycling tests, in-mold electronics disassembly & LCA analysis
	  ○ **AB perspective on WP5** - Discussion about existing car electronics disassembly & recycling processes, in-mold/printed electronics recycling processes and green metal inks production
	• WP7 & WP8 - Overview of dissemination, communication, standardization & clustering activities
	  ○ **AB perspective on WP7** - Discussion about relevant conferences, fairs, political events where the TREASURE project should be presented
	  ○ **AB perspective on WP8** - Discussion about existing WEEE/ELV management standards and ongoing political interventions

16:40	Questions & Answers + Any other business
16:50	Action list and conclusion (POLIMI)
17:00	End of the meeting

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Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Quadrini	Walter
3	POLIMI	Cimino	Chiara
4	TNO	Harkema	Stephan
5	UNIZAR	Valero	Alicia
6	UNIZAR	Lara	Yolanda
7	SUPSI	Rossi	Ludovica
8	SUPSI	Dell'Ambrogio	Siro
9	SUPSI	Fontana	Alessandro
10	SUPSI	Sorlini	Marzio
11	SUPSI	Jennifer	Nika
12	UNIVAQ	Ippolito	Nicolò
13	UNIVAQ	Ferella	Francesco
14	MARAS	van Schaik	Antoinette
15	MARAS	Reuter	Markus
16	EDGE	Cukeric	Ivan
17	EDGE	Batinic	Marina
18	EUROLCDS	Zutis	Edmunds
19	EUROLCDS	Ozols	Ainārs
20	EUROLCDS	Jurmalis	Nauris
21	POLLINI	Di Francesco	Mirco
22	POLLINI	Brunetti	Alessandra
23	POLLINI	Rachele	Maria Carmela
24	TXT	Morgantini	Marzia
25	ILSSA	Liendo	Marcelo
26	ILSSA	Diez	Angel
27	SEAT	Fernandez	Nuria
28	SEAT	Iglesias	Marta
29	SEAT	Villacampa	Mar
30	WALTER	Erhardt	Inigo
31	WALTER	Hormaetxe	Olatz
32	UNI	Mocchio	Elena
33	UNI	Ferrara	Adriano
34	UNI/CT-38	Cilona	Ornella
35	RIT	Babbitt	Callie
36	MATEPRINCS	Cabrera	Aaron
37	ALFRED	Gaustad	Gabrielle
38	JVD	van Damme	Julien
39	ERION	Campadello	Luca

* RED = AB members

Main decision points (AB members' interventions in bold):

- POLIMI presented the TREASURE consortium and the overall project. Then, **AB members introduced themselves. ERION agreed about the logic of simulating processes before implementing them in practice.**

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- SUPSI presented WP1 activities, and each task leader described its reference task. SUPSI presented the reference framework developed in T1.1. POLIMI presented T1.3 logic and the initial requirements gathered from use case leaders. Finally, TXT discussed about the TREASURE platform functionalities and requirements. **ERION asked about the TREASURE platform completion considering pilots activities.** POLIMI answered that these are parallel activities and the platform will be available before the validation & demonstration activities will be implemented. **RIT asked about data management issues**. MARAS commented that the TREASURE platform will be developed in parallel to the individual activities (e.g. developing the disassembly module, recycling module and Eco-design module) and the structure and 'design' of these modules will also help and determine the build-up of the TREASURE platform. In addition, data detail is an important point in linking the different modules in a structured manner allowing in- and output between the different modules, which has been mentioned together with the above discussion. A set of data management & sharing procedures will be established during the project. Data will be generated independently by each pilot and, then, matched together. This way, industrial partners will be actively involved in terms of thinking about how to manage their data.
- SUPSI presented WP2 activities, and each task leader described its reference task. SUPSI presented the set of sustainability/circularity methodologies identified and asked to AB members about their perspective on several points. About "open vs closed-loop" approaches, **ERION answered that closed-loop is preferrable (already adopted in e-waste management)**. MARAS agrees by explaining that the closed-loop is the only basis for providing recycled content for the open-loop system. Closed loop approach is essential for circularity. The use of recycled content is only a consequence of it. RIT asked about the quality of recovered materials and related credits. MARAS answers saying that these analyses/assessments will be done in TREASURE on (critical) raw materials, by evaluating disassembly steps linked to most suitable subsequent final treatment processing (i.e. metallurgical processing) in order to limit the material losses and maximize quality of recovered materials/elements. This will also be applied to the pilots compared to the existing recycling infrastructures in order to keep track of quality and losses. **MATEPRINCS points out that the quality of materials does not need to be extremely high, but everything depends on the final usage**. MARAS points out that these parameters will be quantified through simulation models during the project. JVD specified that no one knows if the recovered material is reused to produce new cars (or not). MARAS explains that it does not matter what will be the final usage of the recovered material, but its quality level. Given the time limit, **SUPSI propose to AB members to continue the discussion through a survey they will specifically implement. ALFRED agrees.** SUPSI continues with T2.2 about sustainability/circularity advisory methods, by presenting alternative metrics and KPIs to be embedded in the TREASURE platform. Once again, **SUPSI asked to AB members about their perspective on sustainability/circularity indexes adopted in the automotive sector**. Given the time limit, their survey will cover also these elements. Finally, EDGE presented T2.3 about the social impact assessment and the Semantic Social Network Analysis. **RIT was interested on it.**
- UNIZAR presented WP3 activities, and each task leader described its reference task. **ALFRED asked about the type of datasets we are considering**. SEAT specified that we are considering three car models produced in the period 2005-20019 sharing several

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parts of other VW Group models. **ALFRED asked about the market share of these models.** SEAT said that the segments, on which they are based, represent 20-25% of the market. **ALFRED asked for the chance to adopt eco-design guidelines to these obsolete vehicles.** SEAT confirmed. **JVD pointed out that disassembly information is available on the IDIS platform but restricted to car dismantlers. JVD agrees about the difficulty to gather this information and agrees about having different levels in terms of disassembly.** MARAS points out the level of detail in data which will be applied in this project, which is generally not available through IDIS. **ERION confirms about the relation between disassembly costs and recovery yields.** UNIZAR specified that this relation is guaranteed by the thermodynamic rarity assessment. MARAS confirms that recovery will be balanced with different intensities of disassembly and corresponding costs to achieve optimal recovery.

- TNO presented WP5 activities, and each task leader described its reference task. POLIMI introduced its pilot station dedicated to PCB semi-automated disassembly. UNIVAQ described some initial materials recycling tests implemented on EUROLCDS and TNO samples. TNO discussed about in-mold electronics production processes, initial polycarbonate disassembly tests and LCA analyses. MARAS pointed out some details about a slide on the simulation model. **MATEPRINCS specified that the recovery of Ag is fundamental and future metal inks will be based on more common materials (e.g. Cu and Al)**. TNO agrees. **RIT pointed out that we need to define a strategy about the quality level to be reached for each material**. TNO agrees. WALTER specified that we need to transform Ag into metal inks, and we do not have a dedicated partner. **MATEPRINCS pointed out that they have a catalogue of about 20 different metal inks and recovered metals must follow precise requirements in terms of particles features and they are available to support us**. TNO agrees with MATEPRINCS and invited UNIVAQ to take part to the discussion in a future confcall.
- UNIZAR presented WP7 activities. **JVD proposed IERC and IARC as possible conferences where publicising the TREASURE project and asks about several issues: 1) How car makers outside the consortium could exploit the TREASURE platform (e.g. providing data)? 2) How LCA will be implemented? 3) Which economic/financial impact is expected from our solutions in terms of disassembly and materials recovery and how to emphasize them to get support from all stakeholders? JVD continued its discussion saying that car makers agree to disassemble and recycle cars, but the efficiency of the ELV management system must be guaranteed.** About this last point, MARAS answered that from the beginning the ELV management system, because of the Fe-based design of traditional car designs, has been focused on the recovery of major metals (e.g. ferrous metals, later expanded to non-ferrous metal recovery - e.g. Cu and Al). The recovery of minor elements (amongst which also the critical ones) is not well considered in this shredding-based approach. However, the material composition of cars is still evolving and changing, and we need to re-consider the way of recycling ELV's. If we want to really apply Circular Economy in car recycling, we need to re-think the way we are designing cars and we need to re-design also the ELV management system in order to increase its efficiency, in spite of the still shredding-based approach of ELV recycling systems, moving to a modular recycling approach in which intensity of disassembly is crucial. **JVD clarified that it was not its point of view, but the one coming from car makers.**

Given the time limit, WP8 activities were not discussed.

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Following steps:

- **SUPSI will send ASAP a questionnaire to the AB members** in order to gather their perspectives about open issues related with sustainability/circularity assessment & advisory methodologies.
- **TNO will organize a specific confcall with MATEPRINCS and UNIVAQ** in order to discuss about metal inks and needed quality of recovered materials.

3.3. 2nd General Assembly with Advisory Board members

The 2nd General Assembly with the presence of the TREASURE Advisory Board was held on the 30th of June 2022 (14:00 – 18:00). The goal of this meeting was to update AB members about the activities done in the first year of the TREASURE project.

Agenda:

14:00	Welcome (POLIMI)
14:05	Project partners short introduction, AB members short introduction (All) Short introduction of each actor – approximately 1 minute per actor
14:25	EU periodic reporting/financial procedures (EU Project Officer – Stefania Rocca)
14:45	Project overall presentation (POLIMI) Short overview of the project, connection among WPs, summary of activities, reached milestones, expected contributions from AB members

15:00	Storytelling of past and ongoing activities – Part 1
	Power Point Presentation of each WP leader (general overview and ongoing activities + details from Task leaders if needed) – approx. 25 minutes per WP (15 min presentation + 10 min discussion)
	• WP1 – Summary of the reference framework, use cases description and macro-level platform requirements (SUPSI)
	  ○ **AB perspective on WP1**
	• WP2 – Summary of circularity & sustainability assessment methods selected (SUPSI)
	  ○ **AB perspective on WP2**
	• WP3 – Summary of disassemblability & recyclability assessments (UNIZAR)
	  ○ **AB perspective on WP3**

16:15	Coffee Break

16:25	Storytelling of past and ongoing activities – Part 2
	Power Point Presentation of each WP leader (general overview and ongoing activities + details from Task leaders if needed) – approx. 25 minutes per WP (15 min presentation + 10 min discussion)
	• WP4 – Summary of the TREASURE platform development activities (TXT)
	  ○ **AB perspective on WP4**
	• WP5 – Summary of PCB disassembly tests, PCB recycling tests, in-mold electronics disassembly & LCA analysis (TNO)
	  ○ **AB perspective on WP5**
	Power Point Presentation of each WP leader (general overview and ongoing activities + details from Task leaders if needed) – approx. 10 minutes per WP (5 min presentation + 5 min discussion)
	• WP7 - Summary of dissemination, communication & clustering activities (UNIZAR)
	  ○ **AB perspective on WP7**
	• WP8 - Summary of exploitation & standardization activities (UNIVAQ)

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	○ **AB perspective on WP8**
17:35	Questions & Answers + Any other business
17:45	Action list and conclusion (POLIMI)
17:50	End of the meeting

Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Cimino	Chiara
3	TNO	Harkema	Stephan
4	UNIZAR	Ortego	Abel
5	UNIZAR	Magdalena	Ricardo
6	UNIZAR	Juste	Rocio
7	UNIZAR	Valero	Alicia
8	SUPSI	Rossi	Ludovica
9	SUPSI	Fontana	Alessandro
10	SUPSI	Jennifer	Nika
11	UNIVAQ	Ippolito	Nicolò
12	UNIVAQ	Vegliò	Francesco
13	MARAS	van Schaik	Antoinette
14	MARAS	Reuter	Markus
15	EDGE	Cukeric	Ivan
16	EDGE	Batinic	Marina
17	EUROLCDS	Ozols	Ainārs
18	EUROLCDS	Jurmalis	Nauris
19	EU Commission	Rocca	Stefania
20	TXT	Calabresi	Mattia
21	TXT	Sesana	Michele
22	ILSSA	Alquézar	Elena
23	SEAT	Fernandez	Nuria
24	SEAT	Iglesias	Marta
25	SEAT	Villacampa	Mar
26	MOVEO	Le Meau	Vincent
27	WALTER	Erhardt	Inigo
28	UNI	Mocchio	Elena
29	UNI	Ferrara	Adriano
30	UNI	Micciché	Giovanni
31	UNI	Fugaroli	Federica
32	UNI	Buscemi	Viviana
33	UNI	Di Maria	Cristina
34	RIT	Babbitt	Callie
35	CENTRO STIRLING	Cabrera	Aaron
36	JVD	van Damme	Julien
37	ERION	Campadello	Luca
38	GENESINK	Dhuiege	Benjamin
39	GENESINK	Croquet	Guillaume
40	ALFRED	Gaustad	Gabrielle

* RED = AB members

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Main decision points (AB members' interventions in bold):

- The PO presented the main steps to follow for the submission of periodic reports. The PO suggested to review the DMP within M18. If some DB are not accessible, please, explain why in the Technical Report. The periodic report must stay within 60 pages (no repetitions of the DoA). Please, justify all the deviations (e.g. Tasks, PMs, budget).
- SUPSI presented WP1 together with TXT and POLIMI. **ERION asked for a list of MVP prioritization.** TXT answered to ERION by describing the D1.2. **ERION suggested to embed some maintenance and disassembly information. ALFRED asks about the data access/protection. ALFRED suggests that there are other modules to exploit, without the need to re-invent the wheel (e.g. A Practical Approach for Social Life Cycle Assessment in the Automotive Industry). ERION asks for the main output of each use case (e.g. procedure, solution, technology). GENESINK asked for KPIs.** POLIMI explained the type of KPIs to be embedded. **GENESINK asked for the types of recycling processes to be considered.** MARAS explained what they are considering in terms of metallurgical processes. **ERION suggests embedding database considering CRMs in the MVP and their treatment.** EU explains that there is still a platform dedicated to CRMs and we should link our platform to these existing platforms. MARAS explain that we are considering all the materials present in car electronics, not only CRMs. There are many platforms, but none of them are considering chemical structures or thermodynamic reactions. We are proposing it.
- SUPSI presented WP2 together with EDGE. **About S-LCA, JVD recommend considering SDGs in our study, because they embed also social aspects. RIT does not know social aspects mapped through S-LCA in automotive, but she knows that there are studies on social aspects related to specific materials and their geographical location (EPEAT - https://www.epeat.net/about-epeat).** SUPSI answers that they are basing on UNEP methodology and on the Social Hotspots and the Product Social Impact Life Cycle Assessment (PSILCA) databases. In the TREASURE context, it is mandatory to evaluate the social performances of automotive value chain in a quantitative manner (not qualitative), so SDG-based methods are not suitable. **GENESINK agrees with JVD about the adoption of SDGs and their prioritization in TREASURE. About circularity & sustainability advisory standards/methods, there are not expertise among AB members. ERION suggests a comparison of EoL scenarios without and with the TREASURE measurement procedures**. SUPSI suggested to discuss this point in either in WP3 or WP5. **JVD answered about scenario assessment tools. They still tested different scenarios and criteria able to prioritize scenarios. However, they are difficult to exploit, especially with lots of parameters. They prefer to have a specific meeting where discussing about these issues. ERION asked for ethnographic details**. EDGE will share with ERION a presentation on it.
- UNIZAR presented WP3 together with SEAT and MARAS. About the automatization of data there are no suggestions. **CENTRO STIRLING suggested considering the reuse of components (not materials) in other sectors and optimize the disassembly process accordingly.** UNIZAR answered that it's not possible because of the variety of components among car brands and models and the electronics evolution rate. It could be possible only considering similar car models. MARAS agrees with UNIZAR and specifies that the high-quality recycling is more practical in order to really create a circular economy. **JVD asks about the dismantling module. We need to consider the time needed to disassemble specific components. About electronics recycling**

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processes, there are automated systems. About dismantling, we need to check for the easy access to these parts. About open data sources, JVD was involved in the SCIP database development and presented some details on it. The next ELV directive will consider also motorcycles and trucks. MARAS agrees that we need to automate the data gathering from databases. MARAS underlines that we are trying to separate car electronics from the rest, in order to increase the recyclability rates of critical/scarce/precious metals. ERION suggests something about eco-design. They need to define parameters/criteria/evidences to facilitate the design of products and embed recycled materials. **ERION said that they have an open database containing data about materials embedded in e-wastes (https://i4r-platform.eu). JVD remarked to MARAS that, instead of having all the data in the same DB, maybe it's better to reduce the effort of data gathering, following the SCIP logic.** MARAS answers that it would not work, because we need to consider all the materials embedded in waste sources, not only some of them.

- TXT presented WP4 together with EDGE. **About recyclability KPIs, JVD asks about explanations on the data lake and its link with IDIS and IMDS. JVD explains some issues about IDIS and IMDS in terms of data stored into them. Some components are not present (e.g. parts produced internally by car makers).** POLIMI answered about IMDS data quality, by agreeing with JVD. However, POLIMI already did a study on car electronics starting from IMDS. It's difficult, but possible. The only issue is to obtain the access to these data. SEAT explained something about IDIS. UNIZAR suggests the extension of IDIS to car electronics. About IMDS, UNIZAR agrees with POLIMI on the difficulty to access data, but SEAT (and VW Group in general) embed also data about car parts internally produced. Instead, SEAT confirms that the composition of PCBs is mandatory in IMDS. **JVD agrees with SEAT, saying that also HONDA is extracting data from IMDS.** SEAT corrects saying that IMDS does not have parts internally produced by car makers, only parts supplied by others. Instead, proper databases (e.g. MISS from VW Group) embeds also these data.
- TNO presented WP5 together with POLIMI and UNIVAQ. **About recycling of Silver, GENESINK does not have any experience on recycled silver particles, but it should be very interesting to discuss. They prefer wet nanoparticles of Silver – like salt of silver (not solid powders of microparticles). However, if we go to microparticles, they could try to integrate microparticles of Silver in their processes and mix them with nanoparticles.** TNO wants to discuss these issues in a separate meeting. UNIVAQ underlines that the process was developed starting from other EU projects and they can modify the process depending on new input requirements. **ERION suggested starting by step, like done in plastics. So, we need to recover a material that could be easily reused in current/new production processes. About modularity, ERION suggests that the dismantling of products should start from the design stage of production processes.** MARAS agrees and confirms about the importance of the quality of the recovered materials. **CENTRO STIRLING agrees that silver should be recovered (confirming its potential reuse in PV panels). About the shape of particles, CENTRO STIRLING go more into details on this issue, by suggesting additional steps in order to transform the recovered material in something really reusable in industry, by paying attention on impurities.** MARAS answers about impurities, by underlining the need for real solutions. TNO explains that they are speaking with DUPONT and other companies in order to figure out the starting point for recovered silver.

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- UNIZAR presented WP7 together with MOVEO. UNIZAR asks for the contacts of AB members in order to invite them to join our social media profiles. **JVD suggests to re-apply to the next IARC 2023.**
- UNIVAQ presented WP8 together with UNI. UNIVAQ asked for companies willing to really implement a TREASURE plant in order to define business strategies together. **ERION wants to participate in the exploitation roadmap. JVD recommend thinking about how to convince car makers to provide their data. The suggestion is contacting ACEA in order to ask for an interaction.** MARAS agrees on it, but we need to force companies in taking their role in this field/discussion. We need to give the automotive sector a valuable message.

Following steps:

- **SUPSI and JVD will discuss about scenario assessment tools** in a specific confcall.
- **TNO, GENESINK, CENTRO STIRLING and UNIVAQ will discuss about recovered silver** in a specific confcall.
- **A new confcall with just AB members** will be organized **within the end of 2022**.

3.4. 3rd General Assembly with Advisory Board members

The 3rd General Assembly with the presence of the TREASURE Advisory Board was held on the 31st of March 2023 (14:00 – 18:00). The goal of this meeting was to update AB members about the activities done in the first reporting period of the TREASURE project.

Agenda:

14:00	Welcome (POLIMI)
14:05	Introduction of the consortium and AB members (POLIMI)
14:10	Introduction of the UNICORN project (UNICORN coordinator)

14:15	Storytelling of past and ongoing activities – Part 1
	Power Point Presentation of each Task leader (activities carried out till M22, achieved results, next steps) – approx. 5 minutes for presentation + 5 minutes for questions from AB members
	• **WP3 – Automotive value chain digitalization (UNIZAR)**
	  ○ T3.2 – Disassemblability analysis (ILSSA)
	  ○ T3.3 – Recyclability analysis (MARAS)
	  ○ T3.4 – Eco-design, disassemblability and recyclability guidelines and integration with CE indicators (UNIZAR)
	• **WP4 – TREASURE platform design, development & integration (TXT)**
	  ○ T4.1 – Technical Requirements and solution design (TXT)
	  ○ T4.2 – TREASURE data lake development (TXT)
	  ○ T4.3 – Semantic social network analysis module (EDGE)
	  ○ T4.4 – Design of the eco-design, dismantling and recycling modules (UNIZAR)
	  ○ T4.5 – Circular (AI-based) advisory tool (TXT)
	  ○ T4.6 – Functional and non-functional evaluation (TXT)

15:45	Coffee Break
16:15	Storytelling of past and ongoing activities – Part 2 Power Point Presentation of each Task leader (activities carried out till M22, achieved results, next steps) – approx. 5 minutes for presentation + 5 minutes for questions from AB members • **WP5 – Pilot plants reconfiguration/optimization (TNO)**

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	○ T5.2 – Pilot-scale reconfiguration, testing and optimization of a semi-automated PCB disassembly process (POLIMI) ○ T5.4 – Pilot-scale reconfiguration, testing and optimization of a materials recovery process (UNIVAQ) ○ T5.6 – Pilot-scale reconfiguration, testing and optimization of an in-mold/structural electronics prototyping process (TNO) • **WP6 – Validation & demonstration (UNIVAQ)** ○ T6.1 – Semi-automated disassembly of car electronics (POLIMI) ○ T6.2 – Bio-hydrometallurgical materials recovery from car electronics (UNIVAQ) ○ T6.3 – In-mold/structural electronics prototyping of car electronics (TNO) • **WP8 – Exploitation, standardization & business models (UNIVAQ)** ○ T8.1 – Exploitation routes (UNIVAQ) ○ T8.4 – Standardization activities (UNI)
17:35	Questions & Answers + Any other business
17:45	Action list and conclusion (POLIMI)
17:55	End of the meeting

Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Gandini	Lorenzo
3	TNO	Harkema	Stephan
4	TNO	Su	Yibo
5	UNIZAR	Ortego	Abel
6	UNIZAR	Valero	Alicia
7	SUPSI	Dell'Ambrogio	Siro
8	SUPSI	Fontana	Alessandro
9	SUPSI	Nika	Jennifer
10	SUPSI	Rossi	Ludovica
11	UNIVAQ	Ippolito	Nicolò
12	MARAS	van Schaik	Antoinette
13	EDGE	Cukeric	Ivan
14	EDGE	Davidov	Veronica
15	EUROLCDS	Jurmalis	Nauris
16	VITO	Gouze	Nicolas
17	TXT	Antonello	Veronica
18	TXT	Calabresi	Mattia
19	ILSSA	Ballester	Pilar
20	SEAT	Iglesias	Marta
21	MOVEO	Fouquard	Isabelle
22	WALTER	Erhardt	Inigo
23	UNI	Ferrara	Adriano
24	RIT	Babbitt	Callie
25	CENTRO STIRLING	Cabrera	Aaron
26	JVD	van Damme	Julien

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No.	Organization	Family name	First name
27	ERION	Campadello	Luca
28	GENESINK	Dhuiege	Benjamin
29	COVESTRO	Bontenackels	Christoph
30	CUNA	Rodella	Gian Maurizio

*ORANGE = UNICORN project coordinator

** RED = AB members

Main decision points (AB members' and external stakeholders' interventions in bold):

- **VITO (UNICORN project coordinator) presented the project to the TREASURE consortium. JVD, SUPSI and MARAS are interested to exchange ideas with VITO in order to develop future collaborations.**
- UNIZAR presented WP3 together with MARAS. UNIZAR presented T3.2. MARAS presented T3.3. **ERION asked about the connection between disassembly of whole cars and recycling of components**. MARAS specified that the focus is on electronics and these components will be separated from the car before shredding. UNIZAR specified that three disassembly levels have been adopted. **VITO asked if MARAS could reduce their DT on components**. MARAS specified that everything depends on data available. Basing on the access on data it is possible to do different simulations and automate the data gathering. UNIZAR presented T3.4.
- TXT presented WP4 together with EDGE. TXT presented all the work done on the platform and the different modules**. JVD liked the platform, but the data layer of the system has some issues from their view. How data are essential in the overall system?** TXT asks that data are essential, are coming from not-always open databases. TXT is working on this issue with SEAT. **JVD agreed on this view because confidentiality agreements are still an obstacle. IDIS is a problem in terms of access, IMDS is a problem in terms of gathering the bill of materials.** TXT is thinking on it. **JVD suggest making sure to have data from partners, if not information on EoL partners should not be interesting.** MARAS explain that there is a real issue in gathering data from carmakers. We need to address this topic on data if we want to create a real CE. **ERION asked for the kind of market for this platform. Maybe, the car recycler of the future (pre-treatment centres) could exploit this platform (please, check with POLLINI), or the information from the platform can be generalized saying that in certain components of the car could be interesting to be disassembled because of the content in valuable materials. For example, a comparison with disassembly costs and revenues from the component could push current car dismantlers in activating these processes.** TXT explains that they are trying to generalize the information given by the platform in order to exploit it in the whole automotive sector. Also clusters or associations could be interested in this platform. In the WEEE sector they are trying to develop some similar platforms. EDGE presented T4.3.

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- TNO presented WP5 together with POLIMI and UNIVAQ. POLIMI presented T5.2. TNO (Yibo) asks for the end of the disassembled PCB (especially the naked board). POLIMI answers that UNIVAQ is recycling both the components and the naked board. UNIVAQ answered that they are developing different processes, one dedicated to components, another to shredded boards. MARAS added that UNIVAQ is focusing on hydrometallurgical processes and all the metals and valuable materials are recovered. Even if plastics and resins are not considered in TREASURE, UNIVAQ can give some information on them. TNO (Yibo) can offer a way to recover resins, but they need a process for metals. **CENTRO STIRLING asked about the revenue coming from the disassembly process**. POLIMI answered that the proposed solution is just a starting point (advanced from a research perspective, but far from the market). UNIVAQ presented T5.4. **ERION asked if the hydrometallurgical process will be evaluated by MARAS**. MARAS answered that they already benchmarked the TREASURE solution with existing technologies and assessed the performance. **ERION underlined as the breakeven point about the extraction of CRM versus precious metals is a big challenge.** MARAS agrees and adds that also the quality level of recovered materials is essential. TNO presented T5.6. MARAS added some details in terms of LCA analyses on recycled IME.
- UNIVAQ presented WP6 together with POLIMI and TNO. POLIMI presented T6.1. they are refining the disassembly process to improve the overall performance. UNIVAQ presented T6.2. They are working on several ways to recover materials from entire and disassembled PCBs. TNO presented T6.3. They are cooperating with WALTER and MARAS to develop something industrial. **GENESINK asked for samples of metal powders to check if it is possible to produce nanoparticles.** UNIVAQ answered that they can go till the micro level, not the nano level. Also in terms of purity, it is not possible to have perfectly pure metal powders.
- UNIVAQ presented WP8 together with UNI. UNIVAQ presented T8.1. POLIMI underlined the need for a contribution from AB members in terms of KERs developed within the TREASURE project and end users of these KERs. **ERION suggests checking the types of KERs, if they are still creating revenues for partners**. For example, MARAS' KER cannot be the consulting service (because it's their core business) and the same must be checked for TXT and EDGE. **CENTRO STIRLING is asking about the KER on the metal inks. RIT suggests that the integration of the individual contributions should be better stressed.**
- TXT asked to the AB members an opinion about 1) which feature of the platform could be improved and 2) if it's better a platform as a service (PaaS) view or a consulting service perspective. **JVD answered that the platform is not only interesting for consultants, but for recyclers and dismantlers (generally those acting on ELVs). Another perspective is the economic benefit related with these activities, informing dismantlers and recyclers about the benefits coming from CE. ERION suggests the PaaS approach, but several users should exploit the solution. So, technical features need to be improved. JVD identified several**

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progresses and appreciated the approach on both the platform and the improvement of disassembly and recycling processes. The sharing of information within the consortium is good. The responsibility of all the WP managers and task managers is good. A suggestion is how to challenge that all the required information is gathered from all the automotive stakeholders.

Following steps:

- **A new confcall with just AB members** will be organized **within the end of 2023**.

3.5. TREASURE special session at the Raw Materials Week 2023 with AB members

During the RMW 2023, a TREASURE special session has been organized. During this conference, also the TREASURE AB members have been invited. Some of them (JVD and EMPA) were physically present, had the chance to present their perspective to the audience and have been actively involved in the discussion. Other AB members were remotely connected to the event.

Agenda:

09:30-9:45	**Fostering the circular economy in Europe** ○ Daniel Cios, European Commission, Directorate-General for Internal Market, Industry, Entrepreneurship & SMEs (DG GROW).
09:45-11:10	**Cutting-edge circular technologies for the automotive industry** ○ Paolo Rosa. Professor in the Manufacturing Group at Politecnico di Milano and project coordinator of TREASURE and CIRC-UITS H2020 and Horizon Europe projects. ○ Antoinette van Schaik. Founder and Director of MARAS. ○ Manuele Capelli – Research Associate. Technology and Society Laboratory. Empa. ○ Stephan Harkema – Program Manager Sustainable Electronics at TNO at Holst Centre.
11:10-11:30	Coffee Break
11:30-13:00	**Round table: Challenges and opportunities of the automotive industry** (Moderator: Alicia Valero, UNIZAR) ○ Marta Iglesias. Environmental Innovation R&D. SEAT. ○ Steve Brown. Senior Director for Automotive OEM programs within MacDermid Alpha Electronics Solutions. ○ Julien Van Damme. CEO of JVD Consulting. ○ Laurent Vautier. Project Manager in Industrialization and Operational Excellence at Nextmove cluster. ○ Elena Mocchio. Innovation and Development Department. UNI.

Participants (in presence):

No.	Organization	Family name	First name
1	ALPHA	Brown	Steve
2	EMPA	Capelli	Emanuele
3	EU DG GROWTH	Cios	Daniel
4	TNO	Harkema	Stephan
5	SEAT	Iglesias	Marta
6	UNI	Mocchio	Elena

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No.	Organization	Family name	First name
7	POLIMI	Rosa	Paolo
8	UNIZAR	Valero	Alicia
9	JVD	Van Damme	Julien
10	MARAS	Van Schaik	Antoinette
11	NEXTMOVE	Vautier	Laurent
12	KULEUVEN	Gillams	Ben
13	EDGE	Cukeric	Ivan
14	KULEUVEN	De Sittry	Laura Lynn
15	SUPSI	Dell'Ambrogio	Siro
16	CLEPA	Denisenko	Rita
17	EC, HaDEA	Frau	Maria Vittoria
18	POLIMI	Gandini	Lorenzo
19	ACEA	Makie	Antoine
20	UNIZAR	Magdalena	Ricardo
21	SUPSI	Rossi	Ludovica
22	POLITO	Sakatadi	Gyslain Ngadi
23	EC, HaDEA	Xara	Susana
24	ALPHA	Travi	Claudio
25	POLIMI	Perossa	Daniele
26	IHUI	Plean	Thi
27	EC, REA	Rocca	Stefania
28	ASGMI	Pino	Marta
29	CEEW	Rishabu	Jain
30	Euro.com	Parrot	Mario
31	Consultant	Leverette	Ioana

*ORANGE = external auditors

** RED = AB members

3.6. Monthly Topics meetings with Advisory Board members

The following set of Topics meetings with the presence of the TREASURE Advisory Board were held from February to May 2024 (9:00 – 10:30). The goal of these meetings was to present AB members about the functionalities of the different modules constituting the final TREASURE platform and receive from them some suggestions in order to improve it before the end of the project.

1.1.1. February 2024 Topics meeting with AB members

Agenda:

9:00	Discussion about WP5 activities • LCA comparison of conventional PCB and IME
9:20	Discussion about WP6 activities • Updates on demonstration activities
9:30	Discussion about WP3 activities • Updates on KPIs and methodologies
9:40	Discussion about WP8 • Updates on standardization
9:50	Discussion about WP7

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	• Updates on dissemination actions
10:00	Q&A

Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Perossa	Daniele
3	POLIMI	Gandini	Lorenzo
4	POLIMI	Pomo	Laura
5	POLIMI	El Warraqi	Laila
6	ILSSA	Ballester	Maria
7	SUPSI	Rossi	Ludovica
8	SUPSI	Ruiz	Elia
9	UNIZAR	Valero	Alicia
10	UNIZAR	Magdalena	Ricardo
11	UNIVAQ	Ippolito	Nicolò
12	UNIVAQ	Vegliò	Francesco
13	MARAS	Van Schaik	Antoinette
14	UNI	Fugaroli	Federica
15	UNI	Ferrara	Adriano
16	TNO	Harkema	Stephan
17	STIRLING	Cabrera	Aaron
18	EMPA	Capelli	Manuele
19	COVESTRO	Bontenackels	Christoph
20	COVESTRO	Valldeperez	Joaquin
21	GENESINK	Hisham	Idriss
22	GENESINK	Theivanayagam	Deivaraj
23	JVD	Van Damme	Julien
24	WALTER	Del Hoyo	Laura
25	TXT	Antonello	Veronica
26	SEAT	Iglesias	Marta

* RED = AB members

Main decision points (AB members' interventions in bold):

- About WP5, UNIVAQ presented to AB members the hydrometallurgical processes under development and the logic followed to develop them. Some slides about the chemical process were also presented. TNO presented to AB members the IME production and recycling process. They are focusing on the recovery of polycarbonate and silver. MARAS asked to TNO about silver and other materials extracted from recycled IME. MARAS asked to UNIVAQ about the purity reachable with their process, if they see additional improvements and if the silver is completely recovered. **UNIVAQ answered that silver is completely recovered. They asked to GENESINK to check if the recovered silver is reusable, but the amounts are too low to be reused**. UNIVAQ will send the mass balance to MARAS. POLIMI presented to AB members the semi-automated PCB disassembly. During the first iteration with AB members, the cobot was moved by the human operator to disassemble all the components. Then, a more targeted approach has been developed in order to guide operators and the cobot to specific components.

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The difficulty to access data about components is limiting the implementation of AI-based models. However, POLIMI is working in parallel to safety approaches to safely remove components and avoid incidents between the cobot and the human operator.

- About WP6, UNIVAQ will present a patent for the recycling of silver from IME and recycling of indium from ITO glasses. UNIVAQ also checked that the content of gold is very different depending on different car electronic components. UNIVAQ and UNI are working on a standard in order to define the concentration of gold in different car electronic components in order to decide how to manage them.
- About WP3, UNIZAR presented the logic behind the KPIs exploited in TREASURE to measure sustainability & circularity performances. Together with MARAS, UNIZAR and SUPSI detected the CRMs present in car electronics, their disassembly process, characterization of materials (dividing them in metal and non-metal ones). Now they can assess the recyclability degree basing on the disassemblability degree (three levels have been identified). The logic the more the disassembly level, the better recyclability is. However, costs are increasing (also considering additional technologies needed to disassemble components).
- About WP8, UNI presented the CWA action under development.
- About WP7, UNIZAR is developing the video of the project (not too specific). **POLIMI invited AB members to join the Spring School in Paris.**
- **JVD appreciated the presentations, the progresses and some initial results. JVD would like to see the platform in order to check it and suggest some improvements**.

Following steps:

- AB members will join the next Topics meetings in order to continue the discussion.

1.1.2. March 2024 Topics meeting with AB members

Agenda:

9:00	Presentation of the TREASURE platform (TXT + SUPSI) • Demo + interaction with AB members
10:00	Discussion about WP8 (POLIMI) • Updates on single exploitable results and single exploitation strategies • Updates on single & joint IPR strategies • Updates on joint CBMs, joint exploitable results and joint exploitation strategies
10:30	Q&A

Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Perossa	Daniele
3	POLIMI	Pomo	Laura
4	POLIMI	El Warraqi	Laila
5	POLIMI	Invernizzi	Andrea
6	ILSSA	Ballester	Maria
7	SUPSI	Rossi	Ludovica
8	SUPSI	Nika	Jennifer

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No.	Organization	Family name	First name
9	SUPSI	Vincenzi	Mattia
10	SUPSI	Landolfi	Giuseppe
11	UNIZAR	Magdalena	Ricardo
12	UNIVAQ	Ippolito	Nicolò
13	MARAS	Van Schaik	Antoinette
14	UNI	Fugaroli	Federica
15	UNI	Ferrara	Adriano
16	TNO	Harkema	Stephan
17	POLLINI	Rubes	Matteo
18	WALTER	Del Hoyo	Laura
19	TXT	Antonello	Veronica
20	SEAT	Iglesias	Marta
21	NEXTMOVE	Vautier	Laurent
22	STIRLING	Cabrera	Aaron
23	COVESTRO	Bontenackels	Christoph
24	COVESTRO	Valldeperez	Joaquin
25	GENESINK	Theivanayagam	Deivaraj
26	JVD	Van Damme	Julien
27	ERION	Campadello	Luca
28	CUNA	Rodella	Gian Maurizio

*RED = AB members

Main decision points (AB members' interventions in bold):

- About the TREASURE platform, SUPSI presented the GRETA tool's functionalities embedded in the eco-design module and the use case of the SEAT climate module to the consortium and AB members connected to the meeting. **ERION asked about how logistics phases are calculated and modelled (by user or any calculation behind).** SUPSI explained that everything depends not only on the BOM of the product (because several data are usually missing), but also other data that GRETA is gathering from other datasets and software (e.g. companies' ERP). MARAS also answered to ERION. TREASURE is looking also on datasets about existing recycling technologies (and related performances). So LCA-specific scenarios are also linked to GRETA in order to quantify recycling rates. SUPSI adds also that platform is not only GRETA, but a set of other tools that will be presented in the next topics meetings. **JVD is interested in our results. They are really useful for companies**. SUPSI is available to share the link to GRETA to anyone.
- About WP8, POLIMI presented a new hierarchy of the KERs and asked to the consortium a support in order to finalize them. TNO answered that they prefer to have a two distinct ERs (one in the education package and one joint with WALTER). WALTER agrees. UNIVAQ answered to POLIMI. They will interact with ILSSA in order to define a joint ER. SUPSI wants to maintain the methodologies as independent KERs from the GRETA tool. About the GRETA tool's functionalities exploited in TREASURE, SUPSI wants to develop also a CBM. SUPSI suggests moving GRETA in the digital package and assign the eco-design module to UNIZAR. UNIZAR agrees. TXT pointed out that the term "module" is incorrect. Maybe is better to split the infrastructure enabling the eco-design module from the method. This logic should be followed also for the other modules. ILSSA clarified that they do not do hydrometallurgical processes. POLIMI answered. UNIVAQ thinks that they will not develop any joint exploitation neither with ILSSA nor with

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EUROLCDS. MARAS answered to TXT. MARAS sees a joint exploitation of the modules because the digital infrastructure comes from TXT, but the contents come from several partners (UNIZAR, MARAS, SUSPI, SEAT). MARAS agrees with POLIMI to split the assessment and the advisory related with MARAS in two different KERs.

Following steps:

- AB members will join all the next Topics meetings in order to continue the discussion on the platform.

1.1.3. April 2024 Topics meeting with AB members

Agenda:

9:00	Presentation of the TREASURE platform (TXT + SUPSI) • Demo + interaction with AB members
10:00	Discussion about WP8 (POLIMI) • Updates on single exploitable results and single exploitation strategies • Updates on single & joint IPR strategies • Updates on joint CBMs, joint exploitable results and joint exploitation strategies
10:30	Q&A

Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Perossa	Daniele
3	POLIMI	Pomo	Laura
4	POLIMI	Invernizzi	Andrea
5	POLIMI	Gandini	Lorenzo
6	POLIMI	El Warraqi	Laila
7	SUPSI	Rossi	Ludovica
8	SUPSI	Nika	Jennifer
9	UNIZAR	Magdalena	Ricardo
10	UNIVAQ	Ippolito	Nicolò
11	MARAS	Van Schaik	Antoinette
12	UNI	Fugaroli	Federica
13	UNI	Ferrara	Adriano
14	TNO	Harkema	Stephan
15	WALTER	Del Hoyo	Laura
16	TXT	Antonello	Veronica
17	TXT	Calabresi	Mattia
18	SEAT	Iglesias	Marta
19	NEXTMOVE	Vautier	Laurent
20	GENESINK	Theivanayagam	Deivaraj
21	JVD	Van Damme	Julien
22	ERION	Campadello	Luca
23	TSINGHUA	Zeng	Xianlai

*RED = AB members

Main decision points (AB members' interventions in bold):

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- About the TREASURE platform, TXT presented an updated version of the digital toolbox to the audience. The three modules, the data sources and the additional tools embedded in the toolbox have been described into detail. MARAS specified the graphic representation of the material composition of components. In addition, MARAS specified also the KPIs related with recyclability performances. **JVD appreciated about the structure and functionality of the toolbox. Some suggestions are: 1) about the database to be connected with the TREASURE platform (e.g. the SKIP database) and 2) about the spider chart related with the recyclability module (maybe a better graphics is needed – better position at an outer level).** TXT answered that a research on databases to be connected with the platform has been implemented. However, the SKIP database has never been considered. SEAT answered that the SKIP dataset has been considered at proposal writing level, but the type of info embedded were not sufficiently detailed. MARAS appreciated the comment of JVD about the SKIP dataset, but specified that the TREASURE platform does not need info only about materials of concern. However, the TREASURE platform could highlight those materials. MARAS commented the spider chart (that is not really a spider chart, but the metal wheel). **JVD commented again about the parts to be removed. If some parts must be removed and they are dangerous (in terms of safety reasons) they should be labelled.** MARAS and TXT agreed.
- About WP8, POLIMI briefly reminded to the consortium about the current incoming deliverables to be submitted, asking for a proactive collaboration.
- POLIMI reminded to the audience about the Spring School in Paris and the next consortium meeting.

Following steps:

- AB members will join the next Topics meeting in order to conclude the discussion on the platform.
- The next Consortium meeting will take place on **the 18th of April 2024 (one week before the usual timing) in order to avoid an overlap with the TREASURE Spring School in Paris.**

1.1.4. May 2024 Topics meeting with AB members

Agenda:

9:00	Presentation of the DIS pilot (POLIMI) • Description + Demo
9:25	Presentation of the REC pilot (UNIVAQ) • Description + Demo
9:45	Presentation of the IME pilot (TNO) • Description + Demo
10:10	Q&A with AB members

Participants:

No.	Organization	Family name	First name
1	POLIMI	Rosa	Paolo
2	POLIMI	Perossa	Daniele

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No.	Organization	Family name	First name
3	POLIMI	Pomo	Laura
4	POLIMI	Gandini	Lorenzo
5	POLIMI	El Warraqi	Laila
6	SUPSI	Rossi	Ludovica
7	SUPSI	Nika	Jennifer
8	SUPSI	Fontana	Alessandro
9	UNIZAR	Magdalena	Ricardo
10	UNIZAR	Valero	Alicia
11	UNIVAQ	Ippolito	Nicolò
12	UNI	Fugaroli	Federica
13	UNI	Ferrara	Adriano
14	TNO	Harkema	Stephan
15	WALTER	Del Hoyo	Laura
16	TXT	Antonello	Veronica
17	TXT	Calabresi	Mattia
18	SEAT	Iglesias	Marta
19	NEXTMOVE	Vautier	Laurent
20	GENESINK	Theivanayagam	Deivaraj
21	JVD	Van Damme	Julien
22	CUNA	Rodella	Gian Maurizio
23	COVESTRO	Bontenackels	Christoph

*RED = AB members

Main decision points:

- About the DIS pilot, POLIMI presented the results achieved through the semi-automated PCB disassembly process. POLIMI described the solution about the identification of SMD components, monitoring the desoldering process and guarantee the safety of the operator. Because of a lack of information on components, another approach has been developed, by integrating AI with the computer vision. However, also in this case some false positive recognitions are happening sometimes. A video about both the desoldering process and the safety solution (developed together with SUPSI) have been presented.
- About the REC pilot, UNIVAQ presented the results achieved through the hydrometallurgical process. IME, LCD and PCB have been identified as input materials. Basing on the material content and the market price, UNIVAQ classified the most profitable materials to be recovered and optimize the process accordingly. Starting from the FENIX pilot plant, UNIVAQ reconfigured the full process in order to manage a different type of inputs. The chemical solution dedicated to each kind of input has been presented.
- About the IME pilot, TNO presented the results achieved through the IME prototyping process. The IME production process has been described in detail by TNO. Design for recycling was the logic followed in TREASURE, in order to improve the recycling rates of materials from IME and avoid trashing it in

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incinerators together with traditional plastic waste. Through a set of innovative adhesives, disassemblable IME prototypes have been developed in order to easily recover Ag from circuits, components and polycarbonate.

Following steps:

- The next (final) Consortium meeting will take place on **the 29th of May 2024 (directly during the final General Assembly @ TNO)**

4. Conclusions

The TREASURE consortium wants to officially thank AB members for their professional support to the project, high-value suggestions and proactive involvement.

Abbreviations

AB	Advisory Board
IME	In-Mold Electronics
KPI	Key Performance Indicator
LCA	Life Cycle Assessment
PCB	Printed Circuit Board
PSILCA	Product Social Impact Life Cycle Assessment
RMW	Raw Materials Week
SDG	Sustainable Development Goal

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