Zero Emission electric Vehicles enabled by haRmonised circularity

Deliverable 1.1

Harmonized design inception report: roles mapping, methodological framework, and workshop's dynamics

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ZEvRA
Zero Emission electric Vehicles enabled by haRmonised circulArity

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ZEvRA project abstract

ZEvRA's main objective is to improve the circularity of light-duty EVs throughout their entire value chain, from materials supply and manufacturing to end-of-life (EoL) processes, which aligns with the European Union's goal of achieving zero CO2e emissions by 2035, particularly in the EV value chain. To do so, ZEvRA will develop a Design for Circularity (DfC) methodology and a holistic circularity assessment aimed at improving the production of electric vehicles (EVs) based on the 9Rs. This methodology will be validated by developing zero emission solutions for the most important automotive materials, covering > 84% material mix: steel, three versions of aluminium (wrought, casting, and foam), thermoplastics composites (long and continuous fibre-reinforced), unfiled/short fibre plastics, glass, tyres and Rare Earth Elements (REE). These solutions will be supported by a set of digital tools to support the manufacturing of the use cases, the assessment of circularity, traceability, and the virtual integration of components into a full replicable vehicle.

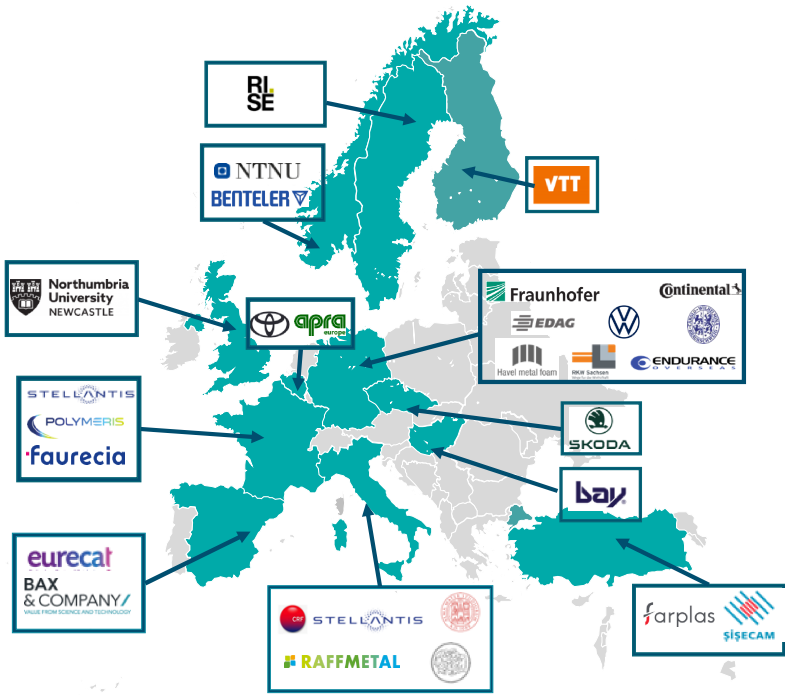

Figure 1 *ZEvRA Consortium*

To maximise the outreach of our methodology and zero emission solutions, ZEvRA will develop a dedicated training & upskilling programme for the automotive workforce and academia, together with activities aimed at increasing awareness & acceptability of the proposed zero emission solutions. Lastly, circular business models targeting EoL and logistics aimed at improving the economic feasibility of circularity in EVs are advanced. ZEvRA's innovations aim to improve zero emission approaches in the life cycle and value chain of at least 59% of European EVs by 2035 through the 5 OEMs and Tier 1's that are part of the consortium(Figure 1), which includes industry and academia covering the entire automotive value chain.

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Executive summary

The pressing need posed by the global environmental challenges and the resource-intensive nature of the automotive industry, emphasizes the urgency for a harmonized design for circularity Methodology to foster sustainability and to diminish end-of-life wastage. This report introduces the methodological framework and the management plan of its application to ZEvRA's project.

ZEvRA's methodological framework outlines an iterative circular design approach built upon the Plan-Do-Study-Act framework[1]. Through training and interactive workshops, stakeholders will exchange ideas, provide feedback, and assist in the definition and alignment of the DfC strategies and specific actions.

1 Introduction

Given the pressing environmental challenges worldwide and more specifically those related to the automotive industry, including its resource-intensive nature, it becomes essential to develop a DfC methodology that can help the sector move towards more sustainable practices while also reduce the sector's end-of-life wastage.

This report provides the methodological framework and a methodological management for ZEvRA's project, with the aim of addressing the previously mentioned environmental challenges by introducing a comprehensive Harmonized DfC Methodology (ZEvRA's Methodology). ZEvRA's Methodology will facilitate the efficient use of materials and energy, as well as a better recovery and recycling of materials at the end-of-life of the vehicle. ZEvRA's Methodology will contribute to the goals of the EU Green Deal[2] and enhance the competitiveness of the sector, particularly, contributing to the requirements of the digital product passport [3]. Through the integration of the 9R's [4] in the methodology, we aspire to establish the circularity requirements that would promote a better use of resources as well as an enhanced environmental performance in the lifecycle of vehicles.

In order to ensure the effective implementation of ZEvRA's Methodology, a management plan has been developed, highlighting the collaborative efforts through training and interactive workshops, to set the background and to implement ZEvRA's Methodology. This methodology will serve as a channel for stakeholders to exchange ideas, provide feedback, and assist in the definition and alignment of the DfC strategies and specific actions. Through the participation of all stakeholders, the goal is to create a sturdy framework that aligns with the industrial and European sustainability goals.

Essentially, through the application of ZEvRA's Methodology and the stakeholder's joint participation, we aspire to generate a significant change in environmental impact, that leads to a more sustainable future.

2 Methodological framework

Our economic system still follows a prevailing linear pattern of producing, consuming, and disposing (even if it includes an end-of-life treatment). This linear orientation requires significant amounts of resources increasingly surpassing what our planet can produce. In this sense, circular economy fosters the creation and closure of resource loops that can facilitate the disconnection between economic growth and resource depletion. The main goal of circular economy is to return resources into the value chain, with product design playing a pivotal role. Ecodesign as a principle and as an approach is defined by the European Environment Agency as the incorporation of environmental considerations into the product development process, balancing ecological and economic needs [5], aiming at minimizing adverse environmental impacts throughout the product's life cycle (from manufacturing to end-of-life), while maintaining quality, functionality, and technical performance. Thus, ecodesign consistently adopts a Life Cycle Perspective. Ecodesign must be considered as a viewpoint in the design process. To carry out design trade-offs and satisfy environmental specifications, these criteria must be considered along with the traditional design criteria based on, usually only, technical specifications.

Aiming for its integration into a comprehensive and iterative process across all phases of product or system development, including the redesign of vehicles, the methodology has been reinterpreted by EURECAT. This involves a participatory approach where the design team, in collaboration with various stakeholders, offers a collective vision of the final product and sets priorities.

To align with the principles of the circular economy paradigm, our methodology not only evaluates specific design actions from technical, environmental, and economic perspectives but also ensures their alignment with the overarching categorization system outlined in the European Commission's 'Categorization System for the Circular Economy' document. This involves assessing proposed actions to be implemented in design, considering their impact and adherence to the circular economy framework. This framework delineates, across four distinct groups, the criteria that proposed interventions must adhere to in order to be classified as representative of the four generic circular business models: circular design and production, circular use, circular value recovery, and circular support.

By integrating these concepts, the DfC methodology will function as a tool to implement the established DfX approach, which will be continuously monitored throughout the project execution.

In practice, the Design for Circularity (DfC) approach draws upon and adapts the procedural steps of the Deming Cycle or PDSA (Plan-Do-Study-Act) framework, thus structuring its implementation into four distinct stages. These stages serve as a systematic guide for carrying out circular design initiatives and ensuring their effectiveness over time. This integration allows for continuous

improvement and refinement throughout the design process, ensuring that circularity principles are effectively embedded and sustained within the project.

Moreover, in accordance with the ISO 14006 standard, every eco-design procedure must be grounded in the concept of the life cycle approach. This presses the need for the consideration of all significant environmental impacts throughout the various stages of the product's life cycle. Consequently, the eco-design strategy will incorporate the life cycle approach.

The DfC methodology has been delineated based on the Plan-Do-Study-Act (PDSA) approach, comprising four distinct key steps, presented in Figure 2:

Figure 2: *DfC key steps*

Step 1: Identification of Hotspots and Life Cycle Stages

In this initial phase, a comprehensive review of existing technologies and conventional practices is conducted to establish a starting point of comparison. This assessment helps identify key areas or stages within the product's life cycle that have the most significant environmental impacts, often referred to as "hotspots." By pinpointing these hotspots, the design team gains insights into where interventions may be most effective in reducing environmental burdens.

Step 2: DfC Strategies Definition and Setup

Building upon the insights gathered in Step 1, the next phase involves defining and setting up DfC strategies. These strategies are appraised by the findings from the hotspot identification process and are aligned with 9R Circularity objectives (Table 1). Through a systematic evaluation, the DfC team determines which strategies hold the most promising results towards sustainability goals.

Table 1 9R strategies [4]

Smarter product use and manufacture	R0	Refuse	Make product redundant by abandoning its function or by offering the same function by a radically different (e.g. digital) product or service
	R1	Rethink	Make product use more intensive (e.g. through product-as-a-service, reuse and sharing models or by putting multi-functional products on the market)
	R2	Reduce	Increase efficiency in product manufacture or use by consuming fewer natural resources and materials
Extend lifespan	R3	Reuse	Re-use of a product which is still in good condition and fulfils its original function (and is not waste) for the same purpose for which it was conceived
	R4	Repair	Repair and maintenance of defective product so it can be used with its original function
	R5	Refurbish	Restore an old product and bring it up to date (to specified quality level)
	R6	Remanufacture	Use parts of a discarded product in a new product with the same function (and as-new-condition)
	R7	Repurpose	Use a redundant product or its parts in a new product with different function
Useful application of materials	R8	Recycle	Recover materials from waste to be reprocessed into new products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations
	R9	Recover	Recovery of (embodied) energy from wastes and residue

Step 3: Re-adaption of Technological Procedures to Selected Strategies

Once the DfC strategies are identified, the focus shifts to re-adapting technological procedures to align with these selected strategies. This entails considering the technical, economic and social aspects within the implementation of necessary adjustments to manufacturing processes, material selection, and product design to minimize resource consumption and enhance sustainability across all stages of the product lifecycle. Feasibility assessments are conducted to evaluate the practicality and viability of proposed changes for implementation.

Within the technical/technological aspects to evaluate, four aspects are essential to inquire in a preliminary manner:

- Feasibility, which involves assessing whether the proposed strategy can be practically integrated into the already existing manufacturing processes, product designs, and supply chain.
- Compatibility, which comprises the evaluation of the possibility to apply the strategy with the existing technologies, equipment, and infrastructure.

- Performance, encompassing the importance to maintain or improve product quality, functionality, and reliability while the DfC strategy is implemented.
- Regulation compliance, which entails evaluating and understanding the compliance requirements related to regulations, certifications, and environmental standards.
- For the economic aspects, three of the most important aspects to consider are: Investment Return. Assess the potential return on investment (ROI) of the DfC strategies application. This involves the estimation of expected financial returns, payback period and profitability.
- Cost-Benefit Analysis. Comparing the upfront costs associated with the implementation of the DfC strategy that entails a redesign of processes or products to the long-term benefits, including cost savings, increased market competitiveness and reputation.
- Market Demand. Consumer preferences for environmentally friendly products is essential. DfC strategies that are aligned with the consumer expectations are more likely to generate economic value and drive market adaptation.

In the case of the social aspects, in the implementation of DfC strategies, two points become crucial:

- Stakeholder engagement and well-being: Understanding how the implementation of DfC strategies will affect employees, communities, and consumers, to ensure that employee well-being, a positive relationship with local communities and consumer awareness are supported.
- Ethical supply chain and inclusivity: Examine the social implication of the implementation of DfC strategies in all the supply chain in order to ensure ethical and fair labor practices that promote inclusivity (cultural and demographic backgrounds).

Step 4: Selection of Concrete DfC Actions and Conceptualized Design

The final step involves selecting specific DfC actions and developing a conceptualized design based on the insights gained from previous stages. The conceptual design serves as a blueprint that integrates environmental considerations into the overall product design. Through iterations involving Life Cycle Assessment (LCA) data (from any point of ZEvRA's Methodology), the design team refines and optimizes the conceptual design until the solutions that meet environmental objectives are achieved. This iterative process ensures that environmental considerations are embedded at the core of the product design, resulting in more sustainable outcomes.

Once DfC actions are established, a follow-up procedure will be determined, and a responsible partner will be designated to ensure a proper alignment of the actions during the application. For the follow-up procedure, periodic meetings and data gathering will be included.

Circularity index (definition will be provided in D1.2) will aid in the selection of the most prominent specific circularity actions within the project. Each action will be provided with a

circularity index value that will then be informed to all value chain actors, participating in the process of DfC.

Prioritize different options is a complex operation, especially if the aim is to do it objectively. Resources are limited, starting with time and money, to accomplish all possible options. Moreover, when rational decisions are needed, involving multiple aspects, humans have never been recognized as objective. Biases influence the decision without any awareness from the same decision-maker. The Analytic Hierarchy Process (AHP) [6]is a powerful yet simple method for making decisions and therefore helps address the issues stated before. It is commonly used for project prioritization and selection.

AHP serves as a method for organizing complex decisions and prioritizing different options towards a same ultimate goal, through math and psychology. Developed by Thomas L Saaty, AHP enables the quantification of strategic goals as a set of weighted criteria[6].

The process involves weighting paired criteria, breaking decision making into small pieces, and pair by pair, solve the bigger decision problem. According to Saaty, a hierarchy tree needs to be defined, starting with the definition of the proposed goal, followed by the criteria and sub-criteria, and finally the alternatives will represent the leaves of the tree. In our case, the 9R will be considered as the goals, that will then be followed by the strategies and finally the alternatives will be the specific DfC actions, Figure 3 depicts the tree up to the 9R strategies.

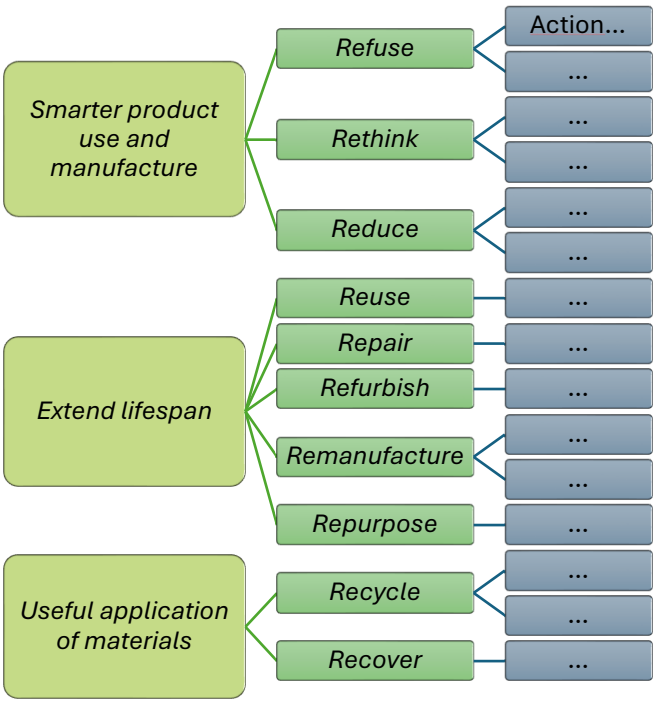

***Figure 3** AHP Tree example*

The evaluation of the tree is based on a pair-wise comparison, and it is made bottom-up, starting with the comparison of the alternatives of the sub-criteria of the last level (in this case the specific

DfC Actions) and ending with the proposed goal. The judgment scheme proposed by Saaty is presented in Table 2, and it can be used as a translation of judgments into numbers.

Table 2 *AHP Judgment scores*

Judgment	Score
Equal	1
Moderately better	3
Definitely better	5
Very strongly better	7
Absolutely better	9

Through the AHP methodology, this data is combined to obtain a ranking of the alternatives, DfC actions.

3 Methodological Management Plan

To ensure a cohesive implementation of project tasks, a Methodological Management Plan (MMP) has been developed. This plan customizes the DfC methodology to align with the unique requirements of the ZEvRA project, employing a Who/What/How framework. This framework enhances comprehension by providing insights into how work packages and project tasks align with the chosen methodology, and also aids in the establishment of roles and responsibilities throughout the project execution phase. For a visual overview of the methodological management plan, refer to Figure 4.

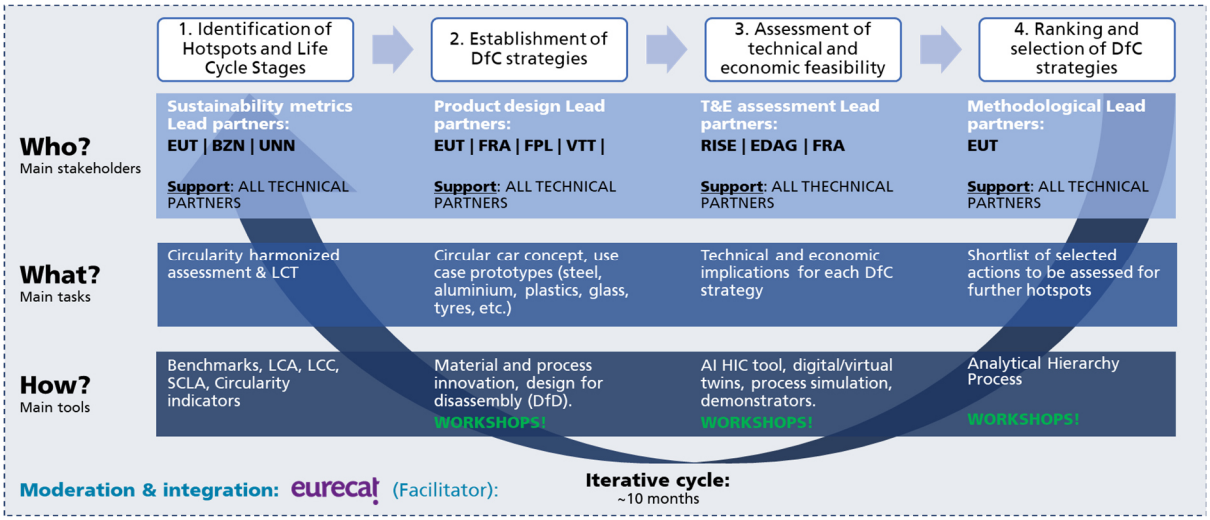

Figure 4 *Graphical summary of the Methodology Management Plan*

The MMP is constructed based on the four steps of the DfC methodology, beginning with the identification of key internal stakeholders for each stage (i.e. the "Who?"). Stakeholders are classified into Main partners, Support partners and Facilitators (WP Leader), in order to delineate their varying levels of direct accountability while establishing the comprehensive work ecosystem involved in each step of the methodology. This categorization provides pertinent information for a well-informed approach. To maintain alignment with the project proposal, the role differentiation mirrors the leadership structure outlined for the work packages, ensuring consistency in agreed-upon responsibilities.

The dynamic nature of this methodology introduces additional considerations during project execution. Specifically, "Main", "Support" and "Facilitator" partners are entrusted with various responsibilities to uphold project integrity, and it is important to clarify that no hierarchy relations are stablished between them. Instead, they constitute equally important "legs of the chair" with the aim to achieve the project's objectives. Nonetheless, their roles do differ within the methodology and are described as:

- **Main partners:** Their role is similar to that of a "Product Owner", which means they have clarity on the requirements that are expected from each task at each stage of the methodology. They act as technical experts who consolidate the information developed by

the support stakeholders, as well as themselves. Also, they approve or provide feedback on the quality of such developments, creating an information loop until there is a final version.

- **Support partners:** They constitute what we would call "The Team". Support partners are in charge of the day-to-day implementation of the tasks that will deliver the final result. They are expected to give regular updates on the status of the tasks, as well as escalating any relevant risk/blockage that they might be encountering.
- **Facilitator:** the Facilitator (in this case, Eurecat) has the role to ensure that the methodology is performed according to the MMP. They guarantee that both Main & Support partners have the required resources and information to perform their roles correctly and safeguard the constant and transparent flow of information to ensure that goals are achieved successfully. The Facilitator must also effectively address any potential restrictions that hinder the implementation of the Methodology, scaling it to the corresponding project authority.

As previously presented, the stages of the methodology were matched with corresponding project tasks that actually respond to the stage's objectives. This corresponds to the "What" section of the MMP, and basically states the content that will be developed within the respective stage. To include the "How" (which wraps up the whole methodological proposition around the MMP), specific methodologies are extracted from the project proposal. The relation between stages, tasks (What) and methodologies (How) is explained as follows.

1) **Identification of Hotspots and Life Cycle Stages:** As it was stated in the Proposal, the methods to identify the main environmental, economic, and social hotspots in the project are the Circularity Assessment and the Life Cycle Thinking (LCT) methodologies (LCA, LCC & sLCA). These frameworks provide quantitative data on the supply chain stages and product components that mostly contribute to the vehicle's sustainability impacts, and therefore provide objective feedback for the hotspot identification.

2) **Establishment of DfC Strategies:** Some strategies for circularity have already been drafted in the proposal but must be refined and validated within the project's execution. Specifically, the tasks of the circular car concept and the use case prototypes of the evaluated materials (steel, aluminium, plastics, glass, tyres, etc.) are the ones to be implemented at this stage. To achieve its implementation, material and process innovation is going to be applied in order to substitute the current practices from the automotive industry. Also, the Design for Disassembly concept will be used as an input to propose the DfC strategies.

3) **Assessment of technical and economic feasibility:** the technical and economic feasibility is going to be performed by the corresponding Main & Support partners. Internal expertise will be used to assess the feasibility, as well as relevant studies performed within the ZEvRA Project. Virtual simulations and digital twins could be used to replicate real-life conditions to evaluate the different design alternatives that will be

established at the second Stage. These digital versions will be exposed to testing scenarios that will help evaluate their technical feasibility, providing the input for the fourth stage of the Methodology. Economic implications will also be developed through the group's primary information on the required materials/processes/technologies that are required to implement each alternative.

Ranking and selection of DfC actions: Finally, the selection of the final DfC actions is going to be performed as established in the Section 3 of this Document. The AHP was selected as the methodology to decide on a multi-factorial scenario, as it combines qualitative and quantitative data on a single assessment. A description on how this is applied is detailed in the previous section. However, it should be noted that this constitutes an iterative process; this means that once the final DfC strategies have been defined for the first iteration, the process should be reevaluated with the newest version of the Hotspot identification (Stage 1).

As it would be expected, changes to the selected strategies will decrease as the project advances. The iterative character of the process intends to provide a flexible and adaptive framework, allowing for real-time adjustments and refinements to ensure the strategies remain aligned with evolving project requirements and goals. Having three iterations allows the project to quickly deliver value to the stakeholders. Even though the first iteration is not the definitive version of the final design, it provides a first glance of the potential value that could be delivered at the end of the project, and partially establishes a group's direction. In other words, it enables an incremental value delivery process, rather than delivering all the value at the project's completion.

A summary of the proposed MMP's framework for the iteration management, together with the main roles involved, is presented in Figure 5.

Figure 5 *Roles and iterative stages of the MMP*

4 Workshop's dynamics

Workshops serve as organized sessions for teaching (delivering information) and learning (gathering information), typically conducted in manageable groups. They are designed to foster active participation and facilitate the exchange of knowledge, leading to consensus-driven conclusions. ZEvRA's Methodology will leverage these workshops to enhance collaboration among Support and Lead partners, fostering a collaborative and synergistic approach to data recruitment.

The primary objectives of these workshops are twofold. Firstly, to (1) identify and conceptualize hotspots and barriers related to circular design and establish the most effective DfC strategies to achieve the project's goals. Secondly, (2) to detect, define, highlight, and rank new approaches that will guide circular design across various use case components and other relevant aspects.

Taking this into account, a series of workshops have been planned in two phases around ZEvRA:

- A series of training-workshops to set a common knowledge background for all the assistants.
- A series of interactive workshops to implement the steps 2, 3 and 4 of the ZEvRA Methodology (summarized in this document).
- A series of one-on-one workshops with technical partners involved in the different use case components to summarize the obtained results and select the concrete DFC actions.

**See Planning section for estimated dates.*

4.1 Workshop's deployment

In order to achieve the better development of the workshops and achieve the defined goals of the ZEvRA Methodology, the workshops will be driven as it follows:

Training - workshops:

- Introductory phase and presentation of the methodology to be applied during the session.
- An exposure phase where the identified hotspots will be presented.

Interactive - workshops:

- A dynamic phase, following the brainstorming approach, about the alignment of the strategies to the technical performance aspects, and its barriers, aligned with the objectives of circular design.
- A resume phase which will result in a repository of strategies in datasheet format.
- A dynamic phase, following the brainstorming approach, about the potential actions, and its barriers, aligned with the objectives of circular design.

- A dynamic phase, following the brainstorming approach, in which the strategies aligned with the different use case components will be validated and ranked.
- A post-workshop phase which will consist in the elaboration of a meeting's minutes which will be shared with the consortium.

One-on-One workshops:

- Introductory phase and presentation of the methodology to be applied during the session.
- An exposure phase where the pre-defined strategies will be exposed in detail.
- A post-workshop phase which will consist in the elaboration of a meeting's minutes which will be shared with the actors involved.

Given the number of planned workshops and the need of participation of many partners staff, two workshop modalities are expected to be develop, hybrid and on-line. Thus, predefined needs and requirements for the development of the workshops are defined as follows:

4.2 Preparation

Objective: The central focus of the workshop revolves around establishing a clear goal to anchor the discussion. In the context of ZEvRA, this goal centres on circular design within the automotive industry. In alignment with this overarching objective, the workshop aims to identify and analyse the environmental, economic, and social aspects influencing circular design. This includes exploring the interconnections between these three aspects at Consortium workshops and formulating strategies to improve them at individual workshops. By concentrating on these elements, the workshop seeks to enhance the proposal and selection of circular strategies.

Workshop leadership: EURECAT's team, as leader of the task, will act as Facilitator of the discussion. The team will consist of at least two members.

The Facilitator's role involves initiating and overseeing discussions to create an environment where crucial dialogues naturally unfold. Collaborating with Lead & Support partners, they co-facilitate the workshop dynamics. Their ability to maintain a nuanced perspective on both partners' contexts and circular design methodologies helps anchor discussions effectively.

Moreover, the Facilitators contribute to organizational efficiency by sharing and dividing roles, including facilitating group discussions, note-taking, documenting, clustering, and other essential tasks. This collaborative approach streamlines the workshop process, ensuring a well-coordinated and productive environment for meaningful interactions and outcomes.

In addition, the **Scribe** will actively track the discussions with the objective of summarizing the main ideas at the end of the session trying to highlight:

- The main barriers and potential benefits around the circularity issues to be tackled.

- Possible solutions and approaches to overcome them by means of the responses generated/validated from those emerged in the workshop dynamic.
- Points of general agreement and disagreement which feed the discussion and active participation of attendees.

In the last part of the workshop sessions the Scribe will summarize these points with the intention of finding agreement and debate and offering the possibility to debate them. After that, once the workshop session is finished, the Scribe will present during the closing slot the outcomes of the discussions.

Organization. Workshops has been designed to be held in hybrid or on-line mode. For that reason, different project partners will be in charge of host the workshops. In the case of hybrid workshops, EURECAT will:

- Appoint someone in the organization to take the lead on co-planning with EURECAT the workshop.
- Sending out a "save the date" notice by email (and social media, if appropriate) to publicize the workshop and signing participants up.
- Creating a distribution plan (email list based in the attendees list) and keep track of any announcements and notifications that get sent out.
- Sending out registration information and reminders.
- Distributing the agenda and order/prepare the materials for the workshop at least one week in advance (name tags, dry erase markets for whiteboards, markers, sticky notes, pens, folders to use for participant materials and any promotional or informational materials from the organization and the project).
- Picking the location for the workshop to the right size for the number of people expected as well as the necessary requirements of tables and chairs be easily moved around to create a favourable atmosphere.

Attendees: All partners are considered of interest. In that sense, partners will be committed to define a list of tentative persons which will be necessary to attend. As a general statement, a list of 3-5 representatives with their names, affiliation and role will be necessary. This is so the participants' interests, needs, and experiences are understood, and will help workshop leadership team cover expectations from the participants and elicit their ideas, setting the stage for a good workshop experience.

Venue and resources: To assure successful of the workshop, venue must have the necessary capacity to accommodate the people who will make up the workshop, as well as having the necessary multimedia resources, that is, a screen and connection available to be able to project a PowerPoint presentation. Additionally, to complete the group dynamics, different sticky notes with colours and a blackboard or wall where they can hang the different conceptual schemes on which to place the ideas/writings that the facilitator demands according to the established

dynamics will be necessary. Additional resources like informational packets & materials and if possible, availability of refreshments, will facilitate the work.

Evaluation materials. An online survey will be sent to participants email to get the opportunity to evaluate the workshops and provide feedback to the workshop leadership. It will include the following questions and will be available online to profit time scheduled. Questions to ask will be:

- Overall, how would you rate the quality of this workshop? (1-5 score range)
- What did you think about the duration of the workshop? (Poor/Reasonable/Large)
- How interesting & helpful was the content presented at this workshop? (1-5 score range)
- Did the workshop materials provide sufficient information? (Yes/No)
- How engaging were workshop speakers? (1-5 score range)
- What is your overall rating of the design and delivery of the workshop? (1-5 score range)
- How could the workshop be improved for the future? (1-5 score range)
- Would you recommend this workshop to your colleagues? (1-5 score range)

4.3 Implementation

Workshops can run from as little as an hour to as much as a full day. In the case stated, that is, a workshop that addresses objectives in question, 2h:30min to 3h (including welcoming, breaks, wrap-ups…) is considered appropriate. It is expected that this period will provide enough time to explain the main concepts and methodologies as well as to encourage questions and group interaction.

On the table below, a common approach and initial outline for the planning and undertaking of the workshops foreseen within the strategy discussed around such document is presented.

5 Final Remarks

- The comprehensive nature of the methodology will allow the easy application in ZEvRA and any other circular design challenge.
- The iterative process enables the continuous improvement of the design.
- Participation and collaboration of all stakeholders will be crucial for a more sustainable design and for a better adoption of the DfC strategies.

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