Zero Emission electric Vehicles enabled by haRmonised circulArity

Deliverable D7.6

Innovation and Data Management Plan (DMP) with open science practices, gender dimension and ethics (first version)

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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 CO_2e 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.

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, which includes industry and academia covering the entire automotive value chain.

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Abbreviations and Acronyms

Table 1: *Abbreviations and Acronyms*

Abbr.	Full name
AI	Artificial Intelligence
CAD	Computer-Aided Design
CAE	Computer-Aided Engineering
Catena-X	Automotive industry data exchange network
CATpart	CATIA Part File (Catia models)
CATPart	CATIA Part File (Catia models)
CCTV	Closed-Circuit Television
CE	Conformité Européenne (European Conformity)
CESSDA	Consortium of European Social Science Data Archives
CO2e	Carbon Dioxide Equivalent
CSV	Comma-Separated Values
DCMI	Dublin Core Metadata Initiative
DER	Distributed Energy Resources
DfC	Design for Circularity
DMP	Data Management Plan
DOI	Digital Object Identifier
DRAW	Drawing (various formats)
DWG	Drawing File (Autodesk)
EC	European Commission
EoL	End-of-Life
EVs	Electric Vehicles
FAIR	Findable, Accessible, Interoperable, and Reusable
FEA	Finite Element Analysis
FEM	Finite Element Models
FRP	Fiber-Reinforced Polymer
FSC	Facility Security Clearance
GDPR	General Data Protection Regulation
HE	Higher Education
HIC	Head Injury Criterion
HOR	Human-Oriented Robotics
HTML	HyperText Markup Language
HTTPS	HyperText Transfer Protocol Secure
IGES	Initial Graphics Exchange Specification
IP	Intellectual Property
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group
JSON	JavaScript Object Notation

Abbr.	Full name
KERs	Kinetic Energy Recovery Systems
KPIs	Key Performance Indicators
LCA	Life Cycle Assessment
LCC	Life Cycle Costing
LCT	Life Cycle Thinking
ML	Machine Learning
NCAP	New Car Assessment Program
NDA	Non-Disclosure Agreement
OEMs	Original Equipment Manufacturers
OpenAIRE	Open Access Infrastructure for Research in Europe
ORDP	Open Research Data Pilot
PDF	Portable Document Format
PIDs	Persistent Identifiers
PNG	Portable Network Graphics
PPTX	PowerPoint Open XML Presentation
PSC	Personal Security Clearance
PU	Public Use
REE	Rare Earth Elements
S-LCA	Social Life Cycle Assessment
SMEs	Small and Medium-sized Enterprises
SOTA	State-of-the-Art
SQL	Structured Query Language
STEP	Standard for the Exchange of Product model data
STL	Stereolithography
TIFF	Tagged Image File Format
TSX	TypeScript-specific extension
VR	Virtual Reality
WP	Work Package
WPL	Work Package Leader
XML	eXtensible Markup Language
ZIP	Zone Improvement Plan

1 Executive summary

The ZEvRA project generates a substantial amount of data, necessitating a robust Data Management Plan (DMP) to ensure effective data handling throughout the project's lifecycle. This DMP is designed to align with the FAIR principles (Findable, Accessible, Interoperable, and Reusable), Horizon Europe guidelines, and EU General Data Protection Regulation (GDPR). Key focuses include data security, Gender Dimensions, ethical considerations, and clear allocation of resources and responsibilities among partners.

The DMP, presented initially at the sixth month (M6) of the project, is a dynamic document that will be updated annually to incorporate new developments and necessary revisions. This ensures continuous alignment with best practices and project needs.

The DMP is structured into seven comprehensive chapters:

- Chapter 2 (Introduction) Introduces the DMP and its structure
- Chapter 3 (Data Summary) Summarises for each of ZEvRA´s work packages an overview of the data to be collected, detailing the purpose, types, formats, origin, expected volume, and potential stakeholders.
- Chapter 4 (FAIR Data) explains how ZEvRA will manage all data to ensure the FAIR principles.
- Chapter 5 (Allocation of Resources) estimates the resources needed and identifies data management responsibilities.
- Chapter 6 (Data Security) explains the data security strategy applied in ZEvRA, including the securing storage solutions employed.
- Chapter 7 (Ethical Aspects) explains the ethical considerations related to the data collected/generated.
- Chapter 8 (Gender Dimension) explains the actions that will be undertaken to ensure fair treatment to all genders.
- Chapter 8 (Conclusion) summarizes the DMP and outlines forthcoming steps regarding data control and the project's data management plan.

This DMP is essential for maintaining data integrity, security, and accessibility in the ZEvRA project. By adhering to the outlined protocols, the project aims to ensure that all data-related activities are conducted in a secure, ethical, and efficient manner, supporting the overall success and sustainability of the project.

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2 Introduction

2.1 Deliverable overview

This document called the data Management Plan (DMP) will help ZEvRA project partners managing the data that will be generated during the project. The objective is to make sure that data, from whatever source, is treated according to FAIR principles, the Guidelines on Data Management in Horizon Europe and EU General Data Protection Regulation (GDPR). Furthermore, special attention is attributed to Data Security, Ethical Aspects and allocation of resources and responsibilities. Essentially, this document will explain the way data is gathered, generated, and handled throughout the project lifecycle.

2.2 Structure of the document

The DMP comprises seven chapters:

- **Chapter 2 (Introduction):** Introduces the DMP and its structure

- **Chapter 3 (Data Summary)**: Summarises for each of ZEvRA´s work packages an overview of the data to be collected, detailing the purpose, types, formats, origin, expected volume, and potential stakeholders.

- **Chapter 4 (FAIR Data)**: explains how ZEvRA will manage all data to ensure the FAIR principles.

- **Chapter 5 (Allocation of Resources):** estimates the resources needed and identifies data management responsibilities.

- **Chapter 6 (Data Security):** explains the data security strategy applied in ZEvRA, including the securing storage solutions employed.

- **Chapter 7 (Ethical Aspects):** explains the ethical considerations related to the data collected/generated.

- **Chapter 8 (Gender Dimension):** explains the actions that will be undertaken to ensure fair treatment to all genders.

- **Chapter 9 (Conclusion):** summarizes the DMP and outlines forthcoming steps regarding data control and the project's data management plan.

3 Data Summary

This chapter aims to explain the purpose of data collection/generation and describe the characteristics of the data and the expected volume. It will conclude with an overview of potential stakeholders who could benefit from the data collected and generated in ZEvRA.

3.1 Purpose of the data reuse and generation and its relation to the objectives of the project

In the processes and activities planned in the 7 WP´s of ZEvRA, data will play an important role in achieving the project´s objectives. The main objective per work package and its concern for data management are listed in Table 2 below.

Table 2: *ZEvRA's WPs and the corresponding data objective*

WP	Data objective
1	Collection and management of data on raw material, manufacturing processes, transportation, use phases, EoL management, secondary data sources such as GaBi/ecoinvent and subsequent Life Cycle Assessment (LCA) Data Analysis, Circular Design methodology analysis and Life Cycle Thinking (LCT) Data analysis.
2	Collection, management, processing, analysis and essentially Data Mining for Machine Learning tools, simulation models, component virtual twins and tracing of components and materials. Examples of data needed are: Geometry data, Results from simulations of HIC (Head Injury Criterion), Process parameters data for different material processing techniques, Mechanical properties data for various composite components, Design data for components evaluated for circularity, Data on alternative R9 (Reduce, Reuse, Recycle, etc.) strategies.
3	Integration and evaluation of previously collected data (from WP1 and WP4) to identify a Circular Car Concept. Additional data collection and processing is needed for the identification of joining and (dis)assembly technologies and for the initial requirements of the circular car concept. For the Digital Twin additional Data mining for collection of e.g. material scenarios is planned.
4	Data collection and analysis of various materials, including data on material properties, manufacturing processes, recycling methods, mechanical properties, crashworthiness, and other relevant factors. Data-driven Decision making about material selection, manufacturing processes, component design, and overall vehicle development.

WP	Data objective
5	Developing a virtual learning platform to provide training and upskilling opportunities for researchers, engineers, students, and industrial workforce involved in the project. This platform will leverage data analytics to personalize learning experiences, track progress, and assess the effectiveness of training programs.
6	Performance Monitoring and Reporting: Establish key performance indicators (KPIs) and metrics to track the performance and progress of the project. Utilize data monitoring and reporting systems to assess the effectiveness of circularity strategies, to build a secondary material marketplace, develop vital business plans, influence policy makers, and communicate achievements to stakeholders, investors, and the public.

From the list in Table 2 it is evident that the ZEvRA project will be handling many different types (textual, numerical, categorial, etc.) and formats of data, which will be elaborated further in section 2.2. Here, an important emphasis on either open source or sensitive data categories is described below.

In the open-source category, ZEvRA will aim at a complete openness and protection of Attribution Rights, IP rights, academic integrity and professional reputation.

In the sensitive data category, ZEvRA will follow the classification described under the GDPR. In ZEvRA, there will most probably not be an encounter with official "classified data" i.e. data requiring a Personal Security Clearance (PSC) certificate or Facility Security Clearance (FSC) certificate. The project coordinator and Technical Board will monitor and, if necessary, review this approach with recommendations to the Executive Board.

Evidently, the ZEvRA consortium will re-use existing data. To clarify this further, the partners have indicated data that they are expected to reuse. The source of reuse is clarified in a later chapter. Here, for each work package reutilization of most crucial data is briefly described in Table 2, including the WP leader (WPL). The list is not exhaustive and might be extended further in later versions. The reused data serves the data objectives described in Table 3.

Table 3: *ZEvRA's reused data*

WP	WPL	Tasks	Reused data
1	EURECAT	T1.1	• Internally developed circularity methodology • TransensusLCA methodology and data
		T1.2	• Supportive data for LCA, LCC assessments in the form of report, lists. • Ellen MacArthur Foundation design guides and Material Circularity Indicator
		T1.3	• ISO 14044/14040 • GABI database • Open source LCA , LCC, S-LCA databases

WP	WPL	Tasks	Reused data
2	RISE	T2.1	• Euro NCAP and other relevant standards • Internal steel component mesh designs • Internal Machine learning algorithm that will be optimized
		T2.2	• Existing process simulation data of thermoplastic composite material for comparison/calibration • Existing process parameters and protocols for crystallinity models • Existing protocols and process parameters for model capturing of weld lines • Existing data models on interply behavior of biobased composites that can be applied as a virtual twin. • Existing material characterization data and design models on composites • Protocols for flow models using material cards
		T2.3	• Set of material and simulation parameters for proper FEM simulation to realize a representative Digital Twin of the extrusion and casting processes. • Repository of developed user routines to provide advanced outputs (i.e. microstructural prediction, mechanical proprieties predictions, crash proprieties predictions).
		T2.4	• Existing EoL routes for circularity assessment, mostly to be found in the database of Catena-X
3	EDAG	T3.1	• Existing requirements for performance, characteristics, etc.
		T3.2	• Utilization of existing CAD models of Skoda-Enyaq
		T3.3	• Utilization of existing CAD models of Skoda-Enyaq
		T3.4	• FEM simulation of existing Skoda Enyaq (in addition to the virtual twins and CAD models of T2.2,T2.3, T3.2 and T3. • Data on real time on road traffic conditions
		T3.5	• VR model of existing Skoda Enyaq
4	Fraunhofer	T4.1	• Requirements, system settings and protocols for the manufacturing of steel parts
		T4.2	• Requirements, system settings and protocols for the manufacturing of aluminium parts
		T4.3	• Requirements, system settings and protocols for the manufacturing of composite and plastic parts

WP	WPL	Tasks	Reused data
		T4.4	• Requirements, system settings and protocols for the manufacturing of glass • Requirements, system settings and protocols for the manufacturing of tyres • Existing material/research on recycling of rare earth elements (REE) that are used in the automotive sector
5	UNN	T5.1	• Existing data (Sota) of CE strategies in Europe to perform Market analysis
		T5.2	• Existing Training material relevant to the project outcomes that can be reused • Utilization of several existing platforms and training tools yet to be determined • Existing data to perform benchmark analysis, materials data.
6	Bax & Company	T6.1	• Existing templates and images from the proposal elaboration
		T6.2	• Existing templates of exploitation from previous HE projects e.g. EXPLOITT project for H2020 • Existing databases of the Digiprime • Existing data/information on 9R strategies, multiple sources
		T6.3	• Policy evaluations performed in other projects • Requirements of standardization • Contact lists of other organisations (EU/international) that can be liaised

3.2 Types and formats of collected/generated data

Due to the technical nature of the ZEvRA project, various types of data will be collected and generated. Under the classification of data types, we understand the characteristics or nature of the data, including numeric data, textual data, categorical data, ordinal data, time-series data, spatial data, and binary data.

These different types of data are formatted appropriately based on the application and the objectives of the activities. By data formatting, we mean the representation and encoding of data. Examples of data formats include plain text, structured data (such as spreadsheets), binary files, comma-separated values (CSV), machine-readable formats (such as XML, HTML, JSON, etc.), and compressed formats (e.g., RAR, ZIP, etc.).

Due to the abundance of categories in both format and type of data, in ZEvRA, compartmentalization into two categories will be described: The first category comprises

numerical and structured data, used in computational tasks such as coding, machine learning (ML), modelling, optimization, simulation, and quantitative analysis. The second category consists of textual data, which includes textual information used for communication, documentation, and reporting purposes. This category focuses on qualitative descriptions, narratives, and explanations.

The first category requires a wide variety of file types to adhere to specific formatting and data types suitable to the application. Most commonly for analysis of relatively simple and 2-dimensional data .xls is used. For more involved data sets such as panel data sets used for ML purposes files such as CSV or SQL are already more common and offer more flexibility in analysis. These are data files that are easy to use, exchange and manipulate by all who encounter them, without the need of advanced software tools.

However, due to the technical nature and complexity of some of the ZEvRA tasks, quite specific and less accessible data types are unavoidable in the project. For example, LCA software can only run on specific LCA file types (TSX), and modelling through CAD is typically done with DWG or STEP. CAE uses specific software that has its own proprietary file formats (.cdb, .cdbx) for storing finite element models (FEM), mesh data, boundary conditions, and simulation results. Other formats used for FEA are .inp files for ABAQUS software or. bdf for input definition of FEA simulation through Nastran software. These files will most probably only be read and shared between actors who have access to the appropriate software and who are directly involved in the tasks at hand. The reporting of such tasks will thereby be supported by additional textual documentation.

The second category requires formats that can be easily read, edited, interoperated, and reused among the consortium partners and the surrounding stakeholder network. Therefore, file types that adhere to these standards are mostly used, such as DOCX, PDF, and PPTX. Another type of file, which is not textual but is commonly used for textual purposes, is image files. These will mostly be JPEG, TIFF, or PNG files.

In addition to the overview of the main data objective per WP listed in Table 2 the project partners have provided information about the main types and formats of data they are expecting to be (re)using and generating, which are described in Table 4. Expected sizes of the data are also described. (will be included once fully collected)

Table 4: *Type and format of data in ZEvRA*

WP	WPL	Tasks	Types/Formats of Data
1	EURECAT	T1.1	• Material and process data for the purpose of use case selection generated/collected in the form of report, lists • Iterative design for the circularity methodology to identify life cycle hot spots • Data formats are likely to include: xlsx, docx, pptx, pdf, stp, prt. • Expected size is to be determined
		T1.2	• Supportive data for LCA, LCC assessments in the form of report, lists • To deploy LCT to identify and ratify life cycle hot spots • Data formats are likely to include: xlsx, docx. • Expected size is to be determined
		T1.3	• Evaluation of a baseline scenario together with conclusive LCA, LCC, social-LCA analysis of developed technologies • Data formats are likely to include: xlsx, docx, pptx, LCA database (GABI, .xls) • Expected size is to be determined
2	RISE	T2.1	• Need for large dataset of simulation data for head impact tests on hoods to teach an AI model to perform the same task but faster • Data formats are likely to include: xlsx, CAD (.dwg, .stp), CAE (.cdb, .cdbx) • Expected size is to be determined
		T2.2	• Supportive information for material simulations in the form of report and simulation results • Virtual models of recycled fibre composites • Data formats are likely to include: xlsx, docx, pdf, CAD (.dwg, .stp) • Expected size is to be determined
		T2.3	• Set of material and simulation parameters for proper FEM simulation to realize a representative Digital Twin of the extrusion and casting processes • Depository of developed user routines to provide advanced outputs (i.e. microstructural prediction, mechanical properties predictions, crash properties predictions). • Data formats are likely to include: FEM code database format/user-routine (.cdb, .cdbx). • Expected size is to be determined
		T2.4	• EoL routes for circularity assessment • Summary of circularity and LCT assessment • Data formats are likely to include: pdf, xlsx, docx, images, csv.

WP	WPL	Tasks	Types/Formats of Data
			• Expected size is to be determined
3	EDAG	T3.1	• Set up of requirements and KERs for the demonstrator vehicle (circular concept car) • Data formats are likely to include: docx. • Expected size is to be determined
		T3.2	• Creation of CAD models complying with the circular economy goals • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, Catia models (CATPart), hardware • Expected size is to be determined
		T3.3	• CAD models and datasets aimed at assessing new detachable assembly structures • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, Catia models (CATPart), hardware • Expected size is to be determined
		T3.4	• FEM simulation data driving simulation CAD data • Data formats are likely to include: xlsx, Step, native CAD (CATPart) • Expected size is to be determined
4	Fraunhofer	T4.1	• Several designs of use case demonstrator parts, including simulation • Original data used as a starting point for new material approach • Pictures of use case parts for VR • Data formats are likely to include: jpeg, CAD (CATPart, .dwg, .stp). • Expected size is to be determined
		T4.2	• Proof of the feasibility of producing demonstrators with the new material (casting of new Al type with highest possible scrap content) • During extrusion and casting activities, process data will be acquired and stored in order to provide a reference for Process Digital twin evaluation • Characterization of components (extruded profiles and casted parts) • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg. • Expected size is to be determined
		T4.3	• Part and material selection (compounds with high recycled content) for demonstration. Demonstrators will be generated according to the data. Type of data will include reports and demos • Data formats are likely to include: xlsx, docx, pptx, pdf, tiff, CAD (CATPart, .dwg, .stp) • Expected size is to be determined

WP	WPL	Tasks	Types/Formats of Data
		T4.4	• Tyre prototype information. • Desktop study to write a report on recycling of rare earth elements (REE) that are used in the automotive sector. • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, tiff, .stp). • Expected size is to be determined
5	UNN	T5.1	• Market analysis (gap analysis and SotA). • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, opj. • Expected size is to be determined
		T5.2	• Training material to enhance the awareness of different platforms • Benchmark analysis, materials data • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, opj. • Expected size is to be determined
6	Bax & Company	T6.2	• To conduct observatory study mapping out the current logistics streams of EoL plastics and FRP in the EU. • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, tiff. • Expected size is to be determined
		T6.3	• Policy landscape surrounding EoL investigation, together with the evaluation of their impacts on business and innovation • Data formats are likely to include: xlsx, docx, pptx, pdf, jpeg, tiff. • Expected size is to be determined

The next chapters focus on the data collection process throughout the project, which can vary significantly across work packages and tasks. WP1, primarily addressing Circularity and LCA methodologies, is a good example of a work package that utilizes various types of data files. It largely relies on textual data from open sources to support circularity methodologies. Additionally, project partners will provide direct quantitative input for the LCA. Tabular datasets sourced from open channels, along with more complex file types from predefined LCA models available in specific software, will also be employed.

Due to the complexity and abundance of data types for most work packages, it is essential to keep track of the sources of data collection. ZEvRA will describe 4 sources:

- Open-source data and commercial/proprietary data.
- Data generated through technical activities.
- Direct input method data from the consortium.

- Data collected/generated from dissemination, communication, and stakeholder engagement activities.

3.3 Open-source data and commercial/proprietary data

Within ZEvRA, extensive research must be conducted to ensure advancement over the State-of-the-Art (SOTA). It is crucial that activities requiring pre-existing data utilize the most up-to-date information. Once again, WP1 serves as an example. For the development of a novel circularity methodology tailored to ZEvRA objectives, research must be conducted on the latest and most renowned design-for-circularity methodologies. Much of this information can be found publicly available online and primarily consists of textual data. The LCA, LCC, and S-LCA components of WP1 necessitate life cycle inventory data, which is obtainable from open-source databases such as the eco-invent database. However, it is likely that ZEvRA will also need to utilize paid databases such as the GABI inventory.

Therefore, when sourcing public information for ZEvRA's use, proper referencing will be ensured. In the case of paid information utilized by ZEvRA, the project will refrain from publishing data that is not sourced from open-access repositories.

Examples of sources from which existing data will be collected are: open-source data that will be used are:

- Knowledge, technology and innovation solution providers (e.g., within academic institutions and their technology/knowledge transfer offices, non-university public research organisations, research and technology organisations, high-tech SMEs and large enterprises, etc.).

- Policy designers and implementers at regional, national and EU level (e.g. in regional/national/EU authorities, development agencies, etc.).

- Past EU Projects (such as TranSensusLCA, SALEMA, MARBEL, DIGIPRIME, CIRPASS, etc).

Examples of sources from which data will be collected that might be against a fee are paid journals, databases such as the GABI database, or yet to-be identified databases or repositories. This list will be updated in Y2/3.

3.4 Data generated through technical activities

Through the technical activities, a significant amount of data will be generated. For instance, data from crash testing or simulation modelling will be produced, which will be utilized for further development of the use cases. Here, we are referring to new data that did not exist before the project began and will be shared within the consortium in shareable file formats such as .xslx, .dmg or .stp. It is crucial that the software used for modelling also supports various standard exchange formats like STEP (.stp), DRAW (.dmg) IGES (.igs), and STL (.stl) to ensure interoperability

between different programs. If this is not feasible, it will be crucial for partners involved in the modelling task to use similar software and native file types to facilitate data exchange. An example of this is the native CAD files, CATpart, or the native GABI files .tsx.

3.5 Direct input method data from the consortium

In ZEvRA, many technical activities will require direct input from the consortium. Examples are standards, requirements, mechanical properties of materials, and Depository of developed user routine. Other than that, organizational tasks or tasks related to exploitation will also require interaction with consortium partners for the purpose of data collection.

Therefore, confidentiality criteria must be respected at all times. In the initial input-gathering round of the DMP, all members of the consortium were asked to indicate which data they would like to be treated confidentially and which data could be shared with third parties. These preferences are currently generalized and will be updated in Y2/3 when the size and content of data is clearer. Partner data, including that of the Advisory Board, will be treated according to the preferences indicated by each partner in the DMP.

The collection of data through activities, meetings, electronic communication, questionnaires, etc., will be conducted in each work package and task. The task leader will oversee the organization of data gathering and decide on the format and type of data to be collected. They are expected to organize it in a manner that provides partners with a clear understanding of how to utilize, share, work with, and fill in the data promptly. Data collected from third parties will be subjected to simple gathering methods, such as Google Forms, sheets, etc., to ensure timely and efficient data collection.

3.6 Data collected/generated from dissemination, communication and stakeholder engagement activities

The data coming from social media statistics will be stored in a dashboard and updated periodically. ZEvRA stakeholders are active on LinkedIn primarily, therefore LinkedIn will be the main social media account for ZEvRA, and LinkedIn´s built-in social-stats-notifications will be used to update the dashboard. Both Quantitative (e.g., likes, number of post) as qualitative metrics will be stored in the dashboard. The dashboard will be in a .xlsx format.

Data collected from project events, such as workshops and stakeholder engagement events, is most efficiently gathered directly during presentations. This can be achieved through proper documentation in notes, inputting data directly into PowerPoint presentations, utilizing live whiteboard practices like Miro, and conducting polls. This data can then later be transferred by the responsible parties into reports.

Data from journals/websites & other dissemination and communication channels will be collected through periodic monitoring as well. The data will consist of a list of publications and posts published by the consortium partners. The purpose of collecting this data is to assess the outreach and efficiency of the communication and dissemination activities during the implementation of the project which will also be part of the periodic reporting to the European Commision. For this purpose, a template is foreseen to be shared with all partners to recommend activities to be performed and log the activities they performed. Finally, all the data will be integrated into a dashboard as well.

3.7 Data Utility – Beneficiaries

Table 5 below describes the main beneficiaries of the data used and generated in ZEvRA.

Table 5: Utility of data in ZEvRA

Stakeholder Group	Data Utility
Policy makers (EC, and national governments)	- Policy makers will be able to use the data coming from the LCA and the reviewing of the LCA data collection process to develop new rules concerning the sharing of data for circularity purposes. The challenges arising from IP concerns from OEMs cannot be solved by one collaborative project alone. - Policy makers could also use the learnings from the development of interchangeable productions between actors to create new policies and/or guidelines, as ZEvRA will seek to find the limits to sharing designs to develop a one size fits all car prototype design. - Market analysis data can inform policy decisions regarding investment in sustainable technologies and industries. - Insights from the project can help in shaping funding programs and initiatives supporting circular economy goals.
Tier1, OEMs and general end users	- Data on material properties, manufacturing processes, and recycling methods can aid Tier 1 suppliers and OEMs in making informed decisions about material selection, manufacturing processes, and product design. However, not all these will be shared outside of the consortium, this will be further decided in Y2/3. - End users can benefit from improved product design and manufacturing processes resulting from the project, leading to more sustainable and durable products.
Sustainability support/LCA providers	- Can utilize the project data, especially data from LCAs, to enhance their sustainability assessments and provide more accurate and comprehensive sustainability support to industries and businesses. The data from LC- inventories filled in by parties will most often be confidential and shared within the consortium only, however the method of the analysis will be disclosed to the public.
Academic and research	- Researchers can leverage the project data for further analysis and studies related to circular economy, material science, sustainability, and manufacturing processes.

Stakeholder Group	Data Utility
Institutions	- The data can serve as valuable resources for educational purposes, enriching curriculum and training programs in relevant fields.
Implementers & funders	- Implementers of circular economy initiatives can use the project data to guide their implementation strategies, ensuring alignment with industry standards and best practices. - Funders can assess the impact and progress of their investments in circular economy projects by monitoring key performance indicators and metrics established based on the project data.
ZEVRA Partners	- Partners involved in the ZEvRA project can utilize the data for developing the one-size-fits-all car prototype design, assessing material and component properties, and optimizing manufacturing processes for circularity. - The data can facilitate collaboration and knowledge exchange among ZEvRA partners, enabling them to achieve project goals more effectively and efficiently. - The data will enable the co-design, development, fine-tuning and validation of the project's innovation activities; the data will be used to design, improve, evaluate, and validate circular car solutions. - At the same time, this data should hold meaningful utility for project partners beyond the end of the project as well, enabling them to build and capitalise upon interesting ideas and opportunities that should emerge regarding the exploitation of the project results.

4 FAIR data

In the ZEvRA project, both open-source and sensitive data will be collected, reused, and generated. Sensitive data, in this context, refers to information subject to the GDPR. Notably, no security-classified data will be handled. To adhere to FAIR principles, ZEvRA has opted to manage all internal data, including sensitive information, on a shared Microsoft Teams platform that is available only to project partners. This choice is based on previous experience and is believed to enhance FAIR processes.

Additionally, open-source data intended for public sharing will be stored in repositories tailored to meet specific data objectives. The classification of data to determine its target audience has been preliminarily assessed with input from the consortium, and these considerations are reflected in the accessibility section 3.2.

4.1 Making data findable, including provisions for metadata

4.1.1 Data discoverability and identification mechanisms

Microsoft Teams may not inherently provide persistent identifiers for data, but users can create structured folders and use consistent naming conventions to aid identification. This identification mechanism will be safeguarded by the project coordinator. Furthermore, the project coordinator provided the structure of the folders and naming convention at the start of the project. These identification mechanisms fall under the realm of metadata.

Metadata is defined as "data about data" or "information about information". It is the glue which links information and data across the World Wide Web, and the tool that helps people to discover, manage, describe, preserve, and build relationships with and between digital resources.

Other persistent identifiers/metadata used in ZEvRA are listed below:

- Descriptive metadata that is included in for example deliverable templates, presentations, and data collection sheets. Examples are title, author, date, description, etc.
- Administrative metadata to identify where the data is coming from, such as location information, acquisition information, etc.
- Structural metadata, which is essentially the format in which the data is organized, these are already described in section 2.
- Manual versioning will be performed in reporting templates and deliverables.

4.1.2 Rich metadata and search keywords

Rich metadata essentially refers to detailed and comprehensive information about a dataset or resource. In a way, the structuring through persistent identifiers already contributes to rich metadata. Additionally, through the Microsoft Teams platform all data and resources can be

subjected to a tagging and description system. Search keywords can then be used to locate data even faster, which will add to the richness of the findability, accessibility, and reusability of the associated data or resource. Microsoft Teams does not support automated harvesting and indexing of metadata. Therefore, it has been excluded from the DMP.

4.1.3 Standards

In ZEvRA, the chosen metadata standard is the Dublin Core Metadata standard. This standard, covered by the international standard ISO 15836, is widely recognized for its simplicity and ease of implementation. Originally designed to describe web page content and facilitate search and retrieval, the Dublin Core Metadata element set provides a straightforward framework for describing data resources. Both open-access and sensitive data will be subjected to open and machine-readable metadata following the standard.

4.1.4 Findability for open access data

Before further elaborating the difference between accessibility to open-source data and sensitive data in the next section below. Here the mechanism of findability for open-source data specifically is described. To enhance the findability of open-access data, a standardized identification mechanism will be implemented. This involves assigning globally resolvable Persistent Identifiers (PIDs) to all data uploaded to the repository. PIDs ensure the long-term discoverability, accessibility, and citability of the data in the digital environment. Essentially, each dataset will be assigned a unique identifier code, allowing it to be referenced unambiguously. OpenAIRE ensures that data deposited in the repository is assigned a PID such as a DOI (Digital Object Identifier) or an ARK (Archival Resource Key). The accessibility of OpenAIRE is further explained in section 3.2.

Datasets not uploaded to a repository will be deposited in a searchable resource, such as the project's web portal. They will utilize standard naming conventions to ensure consistency and easy location by project partners within the framework of the project.

4.2 Making data openly accessible

4.2.1 Openly available and closed data

ZEvRA will prioritize making data openly available, focusing on data essential for validating results in scientific publications and deliverables. Following the Open Research Data Pilot (ORDP) approach, the aim is to make scientific data as open as possible while respecting confidentiality, commercial interests, and privacy. Project partners will disseminate data that offer long-term value to external stakeholders, maximizing the beneficial impact of ZEvRA while safeguarding stakeholders' interests.

ZEvRA is part of Horizon Europe and aims to "make the data collected/generated openly available with as few restrictions as possible, while at the same time protecting sensitive data from inappropriate access" (Unige, 2020).

4.2.2 Open access repository

OpenAIRE is integral to ZEvRA's adherence to the Open Research Data Pilot (ORDP) approach, serving as a centralized repository for hosting and disseminating project outputs, including publications, data, and other research artifacts. By depositing these outputs in OpenAIRE, ZEvRA enhances the visibility and impact of its research, ensuring accessibility for researchers, policymakers, and the public. OpenAIRE's commitment to interoperability and standardization fosters a unified research ecosystem, promoting data sharing, collaboration, and reproducibility across disciplines and borders.

OpenAIRE is free and has a standardized access protocol. It furthermore provides mechanisms for managing access during and after the project's conclusion. This may include embargo periods, access control settings, or licensing agreements specified by the data provider. With this, ZEvRA can secure the accessibility of its research outputs for future generations. The identity of users accessing data in OpenAIRE is ascertained through mechanisms such as single sign-on authentication or user registration, ensuring accountability and security. Access control lists and persistent identifiers may further verify and regulate user access based on predefined permissions.

Lastly, OpenAIRE offers comprehensive support and services, which can assist ZEvRA partners in navigating open access policies, metadata standards, and data management best practices, further empowering the project to achieve its objectives and outcomes effectively. Multiple ZEvRA partners have already used OpenAire in the past and established appropriate arrangements for the ZEvRA repository.

¨OpenAIRE aims to establish an open and sustainable scholarly communication infrastructure responsible for the overall management, analysis, manipulation, provision, monitoring and cross-linking of all research outcomes¨ (Openaire.eu)

4.2.3 Anonymization

To ensure privacy, only anonymized and aggregated data will be made publicly available. This means that individual persons cannot be identified in any reports, publications, or datasets resulting from the project. The project partner, BAX, acting as the data controller, will conduct all necessary anonymization procedures to ensure that data subjects cannot be identified. Anonymization involves removing, generalizing, aggregating, or distorting data identifiers. It's important to note the distinction between anonymization and pseudonymization, with the former

making data subjects unidentifiable and the latter allowing for re-identification with additional information. Refer to **Fehler! Verweisquelle konnte nicht gefunden werden.** for good practices for anonymizing both quantitative and qualitative data, as outlined in the Consortium of European Social Science Data Archives (CESSDA) tour guide on data management (2020).

Before anonymization and aggregation, all personal data collected or generated will be treated as closed data to protect the confidentiality of the data subjects. This is particularly crucial for data obtained from sources such as Closed-Circuit Television (CCTV). Consortium partners who collected this data will securely store it in their records for the duration necessary to fulfill contractual obligations, up to a maximum of 5 years after the project's completion, subject to review. During this time, access to personal and security data will be restricted to authorized individuals within the ZEvRA consortium partners, as outlined in chapter 6. After this period, the personal data will be deleted from the respective consortium partner's records.

Table 6: *Data anonymization best practice (Dublin Core standards, DCMI)*

Type of Data	Best Practices
Quantitative data	• Removing or aggregate variables or reduce the precision or detailed textual meaning of a variable. • Aggregate or reduce the precision of a variable such as age or place of residence. Generally, report the lowest level of georeferencing that will not potentially breach respondent's confidentiality. • Generalise the meaning of a detailed text variable by replacing potentially disclose free-text responses with more general text. • Restrict the upper or lower ranges of a continuous variable to hide outliers if the values for certain individuals are unusual or atypical within the wider group researched.
Qualitative data	• Use pseudonyms or generic descriptors to edit identifying information, rather than blanking-out that information. • Plan anonymization at the time of transcription or initial write-up, (longitudinal studies may be an exception if relationships between waves of interviews need special attention for harmonised editing). • Use pseudonyms or replacements that are consistent within the research team and throughout the project. For example, using the same pseudonyms in publications and follow-up research. • Use 'search and replace' techniques carefully so that unintended changes are not made, and misspelt words are not missed. • Identify replacements in text clearly, for example with [brackets] or using XML tags such as <seg>word to be anonymised</seg>. • Create an anonymization log (also known as a de-anonymization key) of all replacements, aggregations or removals made and store such a log securely and separately from the anonymised data files.

Table 7 presents the data to be collected/generated during the project that is foreseen to date to be made openly available through OpenAIRE. Also in some cases, like for the purpose of outreach to the public, the data will also be made available on the project website (Zevraproject.eu). The list is not extensive and will be updated in Y2/3.

Table 7: *Open source data availability*

WP	Data	Date	Medium/format/other notes
1	Deliverables Electronic documents and presentations, including deliverables with a dissemination level: PU (Public) all related to: Final LCA, LCC and s-LCA and Circularity methodology	Immediate for public deliverables once they are approved by the EC.	OpenAire as medium, format not disclosed, updated in Y2/3
2	Deliverables Electronic documents and presentations, including deliverables with a dissemination level: PU (Public) all related to the digital tools	Immediate for public deliverables once they are approved by the EC.	OpenAire as medium, format not disclosed, updated in Y2/3
3	Electronic documents and presentations, including deliverables with a dissemination level: PU (Public) all related to the final car concept, virtual twin and demonstrator	Immediate for public deliverables once they are approved by the EC. Confidential deliverables will not be available.	OpenAire as medium, format not disclosed, updated in Y2/3
4	Electronic documents and presentations, including deliverables with a dissemination level: PU (Public) related to the use cases. KPI's for the evaluation of the solutions	Public deliverables will be available immediately once they are approved by the EC. Confidential deliverables will not be available.	OpenAire as medium, format not disclosed, updated in Y2/3

WP	Data	Date	Medium/format/other notes
5	Electronic documents and presentations, including deliverables with a dissemination level: PU (Public) related to training and awareness.	Repository of training material will become pbulicly available	OpenAire as medium, format not disclosed, updated in Y2/3
6	Electronic documents and presentations, including deliverables with a dissemination level: PU Related to Dissemination, communication and exploitation. All communication material will be openly available	Public deliverables will be available immediately once they are approved by the EC.	OpenAire as medium, format not disclosed, updated in Y2/3
7	Electronic documents and presentations, including deliverables with a dissemination level: PU Related to Dissemination, communication and exploitation. All communication material will be openly available	Public deliverables will be available immediately they are approved by the EC. Confidential deliverables will not be available. Email addressed will be used during the duration of the project.	European Commission audits can occur within 5 years after the project end No names or email addresses will be made public.

Data that cannot be shared through OpenAire, and will only be available to the consortium through the Microsoft Teams platform is described below in **Fehler! Verweisquelle konnte nicht gefunden werden.**. Some data will only be shared with certain partners under the protection of an NDA. For all data that cannot be shared, a justification is provided.

Table 8: *Sensitive Data availability*

WP	Data	Consortium wide /between select partners	Remarks on sensitivity
1	Filled in life cycle inventories of partners	Consortium wide	Protected by NDA/IP rights

WP	Data	Consortium wide /between select partners	Remarks on sensitivity
2	No sensitive data disclosed		updated in Y2/3
3	CAD designs of skoda enyaq baseline vehicle. Requirements of OEMs.	Consortium wide, sometimes only between selected partners	updated in Y2/3
4	CAD designs of components	Consortium wide, sometimes only between selected partners	updated in Y2/3
5	No sensitive data disclosed so far		updated in Y2/3
6	No sensitive data disclosed so far		updated in Y2/3
7	1. All personal information 2. Metadata from Work packages 3. Deliveables and presentations	Consortium wide	updated in Y2/3

4.2.4 Methods, software tools and documentation to access the data

ZEvRA prioritizes the accessibility of project data, aiming to ensure that stakeholders can access it without the need for specialized methods, software tools, or documentation. Users should be able to access the data using common web browsers (such as Mozilla Firefox, Google Chrome,

Internet Explorer, Safari) on various devices including computers (desktops or laptops), smartphones, and tablets.

For the open-access data deposited on OpenAIRE, ZEvRA will make sure that data codes that are used through certain software by the consortium, is transferred to open source code.

Access to closed data will be restricted to authorized project partners via Microsoft Teams platform, which is hosted by the Project Coordinator (Fraunhofer). However, no specialized methods, software tools, or documentation will be required for access.

4.2.5 Data, metadata, code and documentation repositories

Initially, ZEvRA's open data, along with their linking metadata and any relevant code and documentation (if applicable), will be securely stored in Microsott Teams. Once the OpenAIRE repository is prepared for the project use, ZEvRA open-acess data will be transferred. As all of the project's openly available data will utilize Persistent Identifiers (PIDs) such as DOIs, the links to the data will remain unaffected during this transition.

Meanwhile, ZEvRA's data that will not be openly available for sharing will be deposited, together with their accompanying metadata, code, and documentation (if necessary), to Microsoft Teams.

4.2.6 Restrictions

ZEvRA has evaluated the potential restrictions when opting for the OpenAIRE software and has considered it the best based on ethical considerations, rules regarding personal data, intellectual property rights, commercial interests, privacy concerns, and security requirements.

Project partners will primarily utilize OpenAIRE to disseminate the project's data among interested stakeholders. However, there may be instances where embargo periods or restricted access are necessary. Data that is not available for re-use will only be accessible to authorized project partners and/or authorized personnel from the European Commission Services. Regardless, ZEvRA is committed to ensuring open access to all peer-reviewed scientific publications produced within the project, as stipulated in the Grant Agreement.

4.3 Data Interoperability

Data interoperability refers to the ability of systems and services to create, exchange, and use data with shared expectations regarding its contents, context, and meaning (Steele and Orrell, 2017). To enhance data interoperability, ZEvRA has incorporated metadata vocabularies, standards, and methods into its data management methodology.

ZEvRA will utilize the Dublin Core Metadata standard. This standard consists of a concise set of metadata elements designed to ensure data quality and consistency while maintaining broad interoperability with other data sources. The elements of the standard provide a vocabulary of concepts with clear definitions in natural language, which can be easily converted into machine-readable formats such as XML and HTML, enabling machine-processability. Table 9 displays the vocabulary of the Dublin Core Metadata (Sugimoto et al, 2002).

Furthermore, community-endorsed interoperability best practices coming from the manufacturing industry will be applied when necessary if the Dublin practices fail short. This is applicable for example for more involved data practices such as the transmission of 3D data such as FEM simulations or CAD designs, where interoperable open standard CAD software is used as much as possible. Other examples are specific material codes for different material grades that are used in the industry, or using the same industry standards and metrics for vehicle specification.

In case it is not possible to use uncommon ontologies, the project will provide mapping to translate towards interoperability within the project and for future stakeholders. This is for example the case for the Life Cycle Thinking analysis, where a new metric system will be created based on existing analysis such as LCA, LCC, Ellen Mcarthur, etc. These new ontologies will be published publically.

Table 9: *Dublin Core metadata standard vocabulary (Sugimoto et al, 2022)*

No.	Element	Element Definition
1	Title	A name given to the resource.
2	Creator	An entity primarily responsible for making the content of the resource.
3	Subject	The topic of the content of the resource.
4	Description	An account of the content of the resource.
5	Publisher	An entity responsible for making the resource available.
6	Contributor	An entity responsible for making contributions to the content of the resource.
7	Date	A date associated with an event in the life cycle of the resource

8	Type	The nature or genre of the content of the resource.
9	Format	The physical or digital manifestation of the resource.
10	Identifier	An unambiguous reference to the resource within a given context.
11	Source	A reference to a resource from which the present resource is derived.

4.4 Increase data re-use

Data analysis will be validated and made easy to reuse by providing readme files where necessary. These readme files will be linked to the data analysis practice and will be made best usable for each practice. Therefore, for each task that requires the collection and generation of data, that is published openly/through lincensing on the OpenAIRE repository. A separate file will be created using the standard readable format, like .pdf.

In ZEvRA some specific data practices will by licensed so that third parties can ask for an be granted permission to copy, distribute, display, and/or modify the project's data under conditions set by the license. Common conditions found in licenses include attribution, non-derivative use, and non-commercial use. ZEvRA will publish its openly available data under the Creative Commons licensing scheme to encourage reuse and create an equitable and accessible environment. Any updates to this section will be reflected in future DMPs in Y2/3.

Availability for re-use is a key aspect of the ZEvRA methodology for making data FAIR. Sharing data with stakeholders will maximize the project's impact on EU citizens. Data is expected to be available for re-use no later than 180 days after its processing within the project (e.g., collection, anonymization, aggregation, etc.). However, ZEvRA recognizes that some partners may seek to publish scientific results or apply for patents, allowing for a postponement of data release for up to two years. Data that is expected to be reused by third parties after the end of the project, will stay available for 5 years

As part of project activities, routine technical checks will be implemented to ensure data consistency, integrity, correctness, and completeness, as well as to identify and address errors and omissions. These checks encompass various aspects such as data acquisition, handling, application of approved procedures and methods, and documentation. Specific checks will include:

- Validation of measurement methodology (where applicable).
- Verification of correct implementation of measurement/test methodology (where applicable).

- Identification of transcription errors in data input.
- Ensuring scale measures fall within acceptable value ranges.
- Verification of proper naming conventions.
- Inclusion of any necessary caveats with the data.

5 Allocation of resources

5.1 Anticipated costs for making data FAIR

After consideration of the need for potential repositories or other data systems, it was found that the combination of Microsoft Teams as a closed repository and OpenAIRE as an open repository would suit the ZEvRA project and its data principles best. Therefore, no additional cost apart from the regular subscription costs for Microsoft Teams are made. Most entities have indicated to already have a company subscription of Microsoft Teams.

The expenses to collect and generate data are, except for metadata collection, inherent to the project task and therefore naturally covered by ZEvRA´s budget. The project coordinator has budgeted extra time for the collection of Metadata, which is mostly already automated by adhering to the Dublin standards and the use of structured repositories like Microsoft Teams and OpenAIRE (which is designed especially for FAIRness).

Storage costs may arise over time if resources are preserved, and/or require additional data backup. Security cost may arise if the consortium agrees on employing designated security-coded external hard drives to mitigate security breaches.

5.2 Data management responsibilities

Data management responsibilities are assigned simultaneously with task responsibilities. Meaning, that each task leader is responsible for correct data collection and generation according to the DMP and FAIR principles. In addition, Work package leaders will see to correct documentation over all the tasks, and will alarm the project coordinator if there are partners or tasks that are not adhering to standards. The project coordinator will see through that with the help of the DMP and task 7.4 leader Bax, the data is evaluated and transformed/altered if necessary. The Project Coordinator will manage both the open and closed-source repositories.

Specifically for data that has been indicated to remain confidential, an analysis of standing NDAs and other reasons for remaining confidential to the partners will be analysed by BAX. If reason is found that data has no right to remain confidential according to the project objectives or lack of proprietary rights, data will become available openly, if necessary after another revision of the data by the partner of interest.

If partners run into conflicts with regards to data sharing within work packages, they are to revere to the DMP or to BAX.

6 Data security

Within ZEvRA, various measures will be implemented to ensure the security, recovery, and preservation of both open-source (OpenAIRE) and closed-source data (Microsoft Teams). Encryption will safeguard all data stored in both OpenAIRE and Microsoft Teams repositories. Access controls will be enforced to restrict data access to authorized users, particularly for closed-source data within Microsoft Teams.

Each project partner managing data on private servers will implement necessary security measures to minimize the risk of information leakage or destruction, especially for closed data not intended for sharing or reuse within the project framework.

For data recovery and long-term preservation, regular backups will be stored in both OpenAIRE and Microsoft Teams to facilitate recovery in case of accidental deletion, system failure, or security breaches. Automated backup procedures and periodic testing will be established to ensure data integrity and recoverability. Secure transfer protocols, such as HTTPS, will be used for data transfer.

Access to closed or sensitive data will be limited to authorized project partners. In the event of a breach, national supervisory authorities and affected individuals will be notified within 72 hours. Personal data breaches will be documented, outlining relevant details, impacts, and remedial actions taken.

Technical access controls will be integrated into ZEvRA's web portals to define clear roles and access rights, ensuring that only authorized personnel can access stored data.

7 Ethical aspects

ZEvRA handles both meaningful non-sensitive and sensitive data. The former category does not include any specific type of personal data outlined in the General Data Protection Regulation (GDPR). Any personal data gathered or generated within the scope of ZEvRA is managed according to the principles established by Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016.

Data collection/generation in this project is strictly for specified, explicit, and legitimate purposes aligned with project objectives. Additionally, all project partners responsible for data processing throughout the project duration will adhere fully to relevant national and EU regulations.

Special attention concerning privacy is described in the section about anonymisation (4.2.3).

8 Gender Dimensions

The ZEvRA project, aimed at enhancing the circularity of materials in electric vehicles (EVs) and reducing environmental impacts, recognizes the importance of gender dimensions in scientific research and technological innovation. Integrating gender considerations ensures that the project is inclusive, equitable, and maximizes the potential contributions of all stakeholders, regardless of gender. This chapter outlines the strategies and actions ZEvRA will undertake to address gender dimensions throughout the project lifecycle.

- **Recruitment and Selection**: During the recruitment of researchers, engineers, and other project staff, special attention will be paid to encouraging applications from women. Job advertisements and recruitment materials will emphasize our commitment to gender equality.

- **Gender Balance in Research Teams:** Ensuring gender balance within research teams is a critical aspect of the ZEvRA project. We aim to achieve gender parity by promoting the participation of women in all project activities, from leadership roles to technical tasks. This approach not only fosters diversity but also enriches the research process by incorporating diverse perspectives and ideas.

- **Leadership Roles**: Efforts will be made to ensure that women are well-represented in decision-making positions within the project. This includes project management, work package leadership, and key advisory roles.

- **Impact Assessment**: The Life Cycle Thinking (LCT) assessment will include gender-specific indicators to evaluate the social impact of the project. This involves assessing how the project's outcomes might differentially affect men and women in terms of employment opportunities, health and safety, and economic benefits.

- **Gender in Training and Upskilling:** ZEvRA's commitment to gender equality extends to its training and upskilling programs. These programs aim to equip the current and future workforce with the skills needed to implement circular economy practices in the automotive industry.

- **Inclusive Training Programs**: Training materials and sessions will be designed to be inclusive, ensuring that both men and women can equally benefit from the knowledge and skills imparted. This includes offering flexible training schedules and formats to accommodate different needs.

- **Gender Indicators**: Specific indicators related to gender balance and inclusivity will be tracked throughout the project. This includes monitoring the gender composition of project teams, participation in training programs, and the impact of project outcomes on different genders.

- **Annual Reporting**: The project will include a section on gender dimensions in its annual reports, detailing progress made, challenges encountered, and strategies for improvement. This will ensure transparency and accountability in our efforts to promote gender equality.

9 Conclusions

9.1 Summary

This Data Management Plan has been prepared for the H2020 project ZEVRA. It describes the way data will be handled throughout the duration of the project. Data management is becoming increasingly important due to the increased complexity of data within the automotive industry. Also, in order for ZEVRA to be aligned with the EU objectives (Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016), FAIR principles, as well as specific project objectives, the elaboration of a methodology for collecting, generating and storing data is crucial. In this document, the activities required to adhere to the principles, as well as to data security, Gender Dimensions and ethical aspects are addressed. This project aims at maximum impact of generated data and pertinence into future innovations and developments regarding automotive circularity in Europe.

Accessibility of data is highlighted as one of the key important factors of this data management plan, and it follows careful considerations about IP rights. Although ZEVRA is in its first six months, this report aimed to provide a framework which will ensure that both sensitive and non-sensitive data is properly managed, fully considering security and ethics.

9.2 Future work

This deliverable represents information within the first six months of the ZEVRA project. It is therefore expected that further data will be generated for the purpose of the DMP. As such any updates will be incorporated in the subsequent deliverables in Y2/3.

10 References

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