



DATA MANAGEMENT PLAN

Deliverable 1.3

Author: Marko Žabojec, Dinko Đurđević

Status: Final version

Report date: 27.05.2024.

Confidentiality level: Public

DELIVERABLE INFORMATION

| | |
|-------------------------|--|
| Work package | WP 1 – Project Management and coordination |
| Task | T1.2 – Data management |
| Due date | 30.06.2024 |
| Submission date | First submission for review: 18.05.2024 Closing document: |
| Deliverable lead | Gitone Kvarner (GK) |
| Version | 2.0 |
| Authors | Marko Žabojec (Gitone), Dinko Đurđević (Gitone), Monika Junković (Gitone) |
| Reviewers | Dražen Debelić (LDCK), Tina Matovina Trbojević (MCoE), PMB |
| File Name | D1.3_ZEAS_Data Management Plan_final |
| Abstract | This deliverable is the first version of the ZEAS Data Management Plan and comprises the way that research data is handled during and after the project, what data will be collected, processed, or generated, the methodology & standards to be applied and the kind of data sharing. |
| Keywords | DMP – Data Management Plan, Data |

Document Revision History

| Version | Date | Description of change | List of contributor(s) |
|---------|-------------|-----------------------|---|
| V1.0 | 10.06.2024. | First draft | Gitone Kvarner (Dinko Đurđević, Marko Žabojec) |
| V2.0 | 18.06.2024. | Final version | Gitone Kvarner (Dinko Đurđević, Marko Žabojec), MCOE (Tina Matovina Trbojević), LDCK (Dražen Debelić) |



Dissemination level

| | |
|---|--|
| X | PU - Public |
| | SEN – Sensitive (limited under the conditions of the GA - Grant Agreement) |
| | PP - Restricted to other programme participants (including the EC) |
| | RE - Restricted to a group specified by the consortium (including the EC) |
| | CO - Confidential, only for members of the consortium (including the EC) |

EXECUTIVE SUMMARY

This deliverable is the output of Task 1.2 and is formulated in line with the EC Guidelines on FAIR Data management. It represents the first version of the ZEAS Data Management Plan (DMP) describing the data management life cycle of the data to be collected, processed and/or generated by the project and laying out the approach for their sound and FAIR management. It will evolve during the lifespan of the project as a living document and provide details on the data (schemas, datasets, etc.) as well as their management (what type of data, how the data will be collected, shared, handled and preserved according to GDPR), ensuring that all aspects of data handling, treatment, reporting and access are clear to partners.

As part of making research data findable, accessible, interoperable, and re-usable (FAIR), the DMP will include information on:

- the handling of research data during and after the end of the project;
- what data will be collected, processed and/or generated;
- which methodology and standards will be applied;
- whether data will be shared/made open access (as open as possible, as closed as necessary);
- how data will be treated & preserved (including after the end of the project).

TABLE OF CONTENTS

| | |
|--|-----------|
| DELIVERABLE INFORMATION | 2 |
| EXECUTIVE SUMMARY | 4 |
| TABLE OF CONTENTS | 5 |
| LIST OF FIGURES | 6 |
| LIST OF TABLES | 6 |
| ABBREVIATIONS | 7 |
| DMP COMPONENTS | 8 |
| INTRODUCTION | 11 |
| 1 DATA SUMMARY | 12 |
| 1.1 Data Management Plan Guiding Principles | 13 |
| 1.2 Purpose of data collection/generation and relation to the objectives of the project..... | 15 |
| 1.3 Types and formats of data generated/collected | 17 |
| 1.3.1 Data formats..... | 19 |
| 1.4 Reuse and origin of existing data..... | 20 |
| 1.5 Expected size of the data | 21 |
| 1.6 Data utility..... | 21 |
| 2 FAIR DATA | 21 |
| 2.1 Making data findable, including provision of metadata | 21 |
| 2.2 Making data openly accessible | 22 |
| 2.3 Making data interoperable..... | 23 |
| 2.4 Increase data reuse | 24 |
| 3 ALLOCATION OF RESOURCES | 25 |
| 4 DATA SECURITY | 26 |
| 4.1 Data access and storage | 26 |
| 5 ETHICAL ASPECTS | 27 |
| 6 CONCLUSIONS | 28 |
| 7 REFERENCES | 29 |
| CONSORTIUM PARTIES | 30 |
| ANNEXES | 31 |

LIST OF FIGURES

Figure 1: Open access to research data and publication decision diagram14

LIST OF TABLES

Table 1 - DMP Components (following the HE template on Data management plan)8

ABBREVIATIONS

| | |
|--------------|---|
| CA | Consortium Agreement |
| CO | Confidential, only for members of the consortium (including the EC) |
| DMC | Data Management Committee |
| DMP | Data Management Plan |
| EC | European Commission |
| EU | European Union |
| FAIR | Findable, Accessible, Interoperable, Reusable |
| GA | Grant Agreement |
| GDPR | General Data Protection Regulation |
| HE | Horizon Europe programme |
| ZEAS | Ferry demonstrator for the switch to safe use of sustainable climate neutral fuels in Adriatic - Zero Emission Adriatic Ship - ZEAS |
| MB | Management Board |
| M | Month (e.g. M6 is month 6 in project implementation) |
| QAPGM | Quality Assurance Plan including Gender Monitoring |
| OPR | Official Project Repository |
| PP | Restricted to other programme participants (including the EC) |
| PU | Public |
| QDM | Quality and Data Manager |
| RE | Restricted to a group specified by the consortium (including the EC) |
| SEN | Sensitive (limited under the conditions of the GA) |
| WP | Work Package |



DMP COMPONENTS

Table 1 - DMP Components (following the HE template on Data management plan)

| DMP Component | Issues to be tackled |
|--|---|
| 1. Data Summary | <ul style="list-style-type: none"> - Will existing data be re-used and what will it be re-used for? - What types and formats of data will the project generate or re-use? - What is the purpose of the data generation or re-use and its relation to the objectives of the project? - What is the expected size of the data that you intend to generate or re-use? - What is the origin/provenance of the data, either generated or re-used? - To whom might the data be useful ('data utility'), outside project scope? |
| 2. FAIR Data 2.1 Making data findable including provisions for Metadata | <ul style="list-style-type: none"> - Will data be identified by a persistent identifier? - Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary or general standards will be followed? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how. - Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use? - Will metadata be offered in such a way that it can be harvested and indexed? |
| 2.2 Making data openly accessible | <p><u>Repository:</u></p> <ul style="list-style-type: none"> - Will the data be deposited in a trusted repository? - Have appropriate arrangements been explored with the identified repository where the data will be deposited? - Does the repository ensure that the data is assigned an identifier? Will the repository resolve the identifier to a digital object? <p><u>Data:</u></p> <ul style="list-style-type: none"> - Will all data be made openly available? If certain datasets cannot be shared (or need to be shared under restricted access conditions), explain why, clearly separating legal and contractual reasons from intentional restrictions - If an embargo is applied to give time to publish or seek protection of the intellectual property (e.g. patents), specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible. - Will the data be accessible through a free and standardized access protocol? - If there are restrictions on use, how will access be provided to the data, both during and after the end of the project? |

| DMP Component | Issues to be tackled |
|--------------------------------------|--|
| | <ul style="list-style-type: none"> - How will the identity of the person accessing the data be ascertained? - Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)? <p><u>Metadata:</u></p> <ul style="list-style-type: none"> - Will metadata be made openly available and licenced under a public domain dedication CC0, as per the Grant Agreement? If not, please clarify why. Will metadata contain information to enable the user to access the data? - How long will the data remain available and findable? Will metadata be guaranteed to remain available after data is no longer available? - Will documentation or reference about any software be needed to access or read the data be included? Will it be possible to include the relevant software (e.g. in open source code)? |
| 2.3 Making data interoperable | <ul style="list-style-type: none"> - What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data interoperable to allow data exchange and re-use within and across disciplines? Will you follow community-endorsed interoperability best practices? Which ones? - In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow reusing, refining or extending them? - Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)? |
| 2.4 Increase data reuse | <ul style="list-style-type: none"> - How will you provide documentation needed to validate data analysis and facilitate data re-use (e.g. readme files with information on methodology, codebooks, data cleaning, analyses, variable definitions, units of measurement, etc.)? - Will your data be made freely available in the public domain to permit the widest re-use possible? Will your data be licensed using standard reuse licenses, in line with the obligations set out in the Grant Agreement? - Will the data produced in the project be useable by third parties, in particular after the end of the project? - Will the provenance of the data be thoroughly documented using the appropriate standards? |
| 3. Allocation of resources | <ul style="list-style-type: none"> - What will the costs be for making data or other research outputs FAIR in your project (e.g. direct and indirect costs related to storage, archiving, re-use, security, etc.) ? - How will these be covered? - Who will be responsible for data management in your project? |

| DMP Component | Issues to be tackled |
|---------------------------|---|
| | <ul style="list-style-type: none">- How will long term preservation be ensured (costs and potential value, who decides and how, what data will be kept and for how long)? |
| 4. Data Security | <ul style="list-style-type: none">- What provisions are or will be in place for data security (including data recovery as well as secure storage/archiving and transfer of sensitive data)?- Will the data be safely stored in trusted repositories for long term preservation and curation? |
| 5. Ethical aspects | <ul style="list-style-type: none">- Are there, or could there be, any ethics or legal issues that can have an impact on data sharing?- Will informed consent for data sharing and long term preservation be included in questionnaires dealing with personal data? |
| 6. Other issues | <ul style="list-style-type: none">- Refer to other national/funder/sectorial/departmental procedures for data management that you are using (if any) |

INTRODUCTION

The EU-funded ZEAS project aims to expedite the transition toward safe and sustainable, climate-neutral fuels in waterborne transport. The project will showcase a system powered by hydrogen fuel cells designed for maritime applications. This system encompasses a zero-emission passenger ship tailored for the Adriatic Sea, along with solutions for hydrogen distribution, storage, and bunkering.

The main aim of the project is to contribute to accelerating the shift to safe use of sustainable climate neutral fuels in waterborne transport through a full scale on board operational demonstration of a new system powered by hydrogen fuel cells with maritime applications. An international consortium of top-notch entities covering the whole innovation value chain will develop, validate and demonstrate a new zero emission passenger ship powered by hydrogen and the associated hydrogen distribution, storage and bunkering solution. The ship will be specifically designed to operate in the Adriatic Sea, which is known for its pristine environment and sensitive marine ecosystems. The commissioning and validation in the operational environment through sea trials will be performed to ensure compliance with certification authorities. Emissions assessment, environmental performance studies, risk and safety assessments will be performed on the new system. Advanced digital technologies, including digital twin for monitoring, control and simulation and predictive maintenance solution enhanced with augmented reality systems, will also be developed, documented, tested and optimized during the project for ship owners, operators, shipyards and associated engineering firms. Finally, a detailed feasibility assessment and business planning will be developed to establish commercialisation and scalability opportunities. A successful realisation of the project will facilitate the wider adoption of sustainable climate neutral fuels within the European maritime transport sector in line with the Green Deal objectives, contributing to its efficiency, safety, resilience and international competitiveness.

This Data Management Plan (DMP) is implemented using FAIR data principles (Findable, Accessible, Interoperable and Reusable), and outlines the way that data is collected or generated within the ZEAS project and how they will be organised, stored, and shared. It specifies which of the data will be publicly available (open access) and which will be available only to the consortium (confidential), as far as this is possible in this phase.

This DMP describes the standard formats, meaningful metadata, and open repositories to share data and enable other users to build on the knowledge gained during the project.

The first audience to which this report is addressed is the **internal partners**; there are 14 partner organizations from Croatia, Slovenia, Spain, Greece, Austria, Germany and Norway representing academy, industry and societal actors.

The DMP will establish consistent practices among partners to increase the efficiency and robustness of data handling during the lifespan of the project.

The second audience are **business actors in the ecosystem, policy makers, government**, which have an important role in strengthening links between academic and business partners thus fostering academia industry collaboration. Moreover, this audience



is in charge of broadening the results of the project activities, in terms of further implementing hydrogen in maritime and other connected sectors.

The third audience is the **community of local stakeholders, citizens**, as well as R&I professionals. The consortium will get in touch with this audience through organisation of workshops and events within the project activities, as the output of WP6 – Communication, Dissemination and Exploitation activities.

This report is an initial version of the DMP, prepared at the outset of the project. It will be updated as the project progresses, since not all data or potential uses are clear from the beginning.

1 DATA SUMMARY

The ZEAS Data Management Plan (DMP) is part of WP1 - Project management and coordination.

Project management committee will be established at the beginning of project and it will cover data management issues and other issues as Quality Assurance and Gender and Equal Opportunities. It will consist of... and will be in charge of ensuring the data availability and utility through the creation and monitoring of implementation of the Data Management Plan (DMP), which elaborates data generation, collection and processing following the FAIR principles

It aims at setting up a strategy for managing key data generated and collected during the project and enhance access to and re-use of the project's data. This DMP is intended to be a 'living' document, that will outline how the ZEAS data will be handled during and after the project, and so it will be reviewed and updated at regular intervals.

It will be reviewed and updated over the course of the project, in M24 and M48, considering elements such as (but not limited to):

- new data being gathered;
- generation of periodic reports;
- development of final report;
- changes in consortium policies;
- changes in consortium composition and external factors (e.g., new consortium members joining or old members leaving).

Gitone Kvarner is responsible for implementing and disseminating this DMP to all project partners.

Each project partner will be responsible for managing their data, metadata, and ensuring their data meet the quality standard set out by the project.

All project documentation will be stored in a dedicated virtual space, with clearly defined access and editing rights. The consortium will be supported by experienced grants management teams in management and reporting of legal, financial and administrative aspects of project implementation.

ZEAS requires the collection of meaningful data with a view to producing insights that will



successfully inform the project's activities, enabling the project consortium to deliver evidence-based results and ultimately achieve the objectives of the project.

All data collected to this end, e.g., through periodic and annual innovation meetings and events, interviews, questionnaires, training and demonstration activities, other events, etc. to participants, will be controlled and processed on the basis of informed consent, in full compliance with the General Data Protection Regulation (GDPR, EU 2016/679) as well as other relevant, applicable EU and national regulations, protecting the data subjects' rights and freedoms in relation to the processing of their personal data.

Each data set created during the project will be assessed and defined as open, or restricted, at different levels, by the owners of the content of the data set.

All the data sets, regardless of their category, will be stored:

- in each of the participant entities databases and protected cloud storages,
- in the SharePoint folder created as internal data repository of the partners.

The website and social medias will be the main sources of general information for the wide audience, and will include the important project updates, news, results and innovations presented in a clear manner.

1.1 Data Management Plan Guiding Principles

The ZEAS Data Management Plan (DMP) has been drafted following the compliance with

- FAIR (Findable, Accessible, Interoperable and Reusable) Data Management Protocols;
- "Guidelines on Data Management in Horizon 2020" ¹

The ZEAS Data Management Plan (DMP) provides detailed information on:

- 1) the data that the project will generate or collect and make accessible, including their origin, type, format, scale, update frequency and permitted access level – the categories of data will include physical and digital data - textual, numeric, images and experimental data, whereas data types will include software, algorithms, models, protocols, mapping reports and other procedural, analytical and communication documents, spreadsheets and photographs;

¹ http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

- 2) application of the FAIR principles in data management;
- 3) data protection and security actions;
- 4) informed consent procedures;
- 5) management of outputs other than data and publications;
- 6) possible ethics aspects that may arise;
- 7) required resources, including costs and personnel.

It complies with the principle of Open Access according to the Horizon guidelines summarised in the graphic here below:

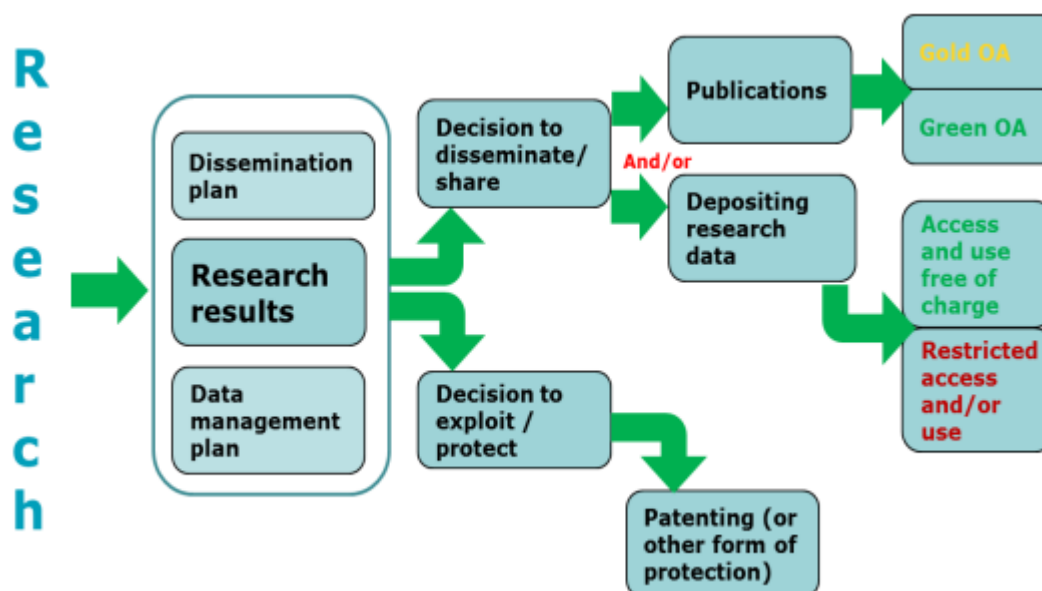


Figure 1: Open access to research data and publication decision diagram ².

The main aspects that will be addressed include:

- a) **Findability:** Personal data collected during the project WP2, WP3, WP4 and WP5 activities will be protected by technical and procedural means, and shared in aggregated forms without personal identifiers through public deliverables and communication

² [Guidelines to the Rules on Open Access to Scientific publications and Open Access to Research Data in Horizon 2020](#)

materials. Persistent identifiers (PIDs) and standardised metadata frameworks will be used to ensure and enhance the findability of research outputs;

- b) **Accessibility and reusability:** taking into account potential postponements to allow the appropriate protection of results generated within aforementioned WPs (the principle 'as open as possible, as closed as necessary'), not all data generated within the project (technical data, codes, designs) will be made available on the project website, disseminated at conferences and via relevant trusted repositories and Open Access publications. The partners agree to treat these type of data as Sensitive. After the data and technical results are used and published in open SCI Journal, it will be available to wider audience (Agreement in CA).
- c) **Interoperability:** data to be collected and generated will be stored in a format that will allow the usage in various computing platforms, complying with open standards and accompanied by adequate metadata;
- d) **Curation and preservation:** data will be curated and preserved in dedicated repositories.

1.2 Purpose of data collection/generation and relation to the objectives of the project

The ZEAS Data Management Plan (DMP) aims at providing a strategy for managing data generated and collected during the project and to optimise access to and re-use of research data.

The categories of data will include physical and digital data - textual, numeric, images and experimental data, whereas data types will include software, algorithms, models, protocols, designs, mapping reports and other procedural, analytical and communication documents, spreadsheets and photographs. Data generated during the project can be divided into the following groups:

- a) Data generated by project partners during the analysis and development activities;
- b) Data generated by the stakeholders participating in the project activities, (i.e., project meetings, project events, ecosystem collaboration, etc.);
- c) Data generated by accompanying measures within the WP6 (i.e. stakeholder engagement activities, knowledge transfer & staff exchange activities, etc.);

The DMP is fully connected to the Dissemination, Communication and Exploitation plan (D6.1).



This document addresses for each data set collected, processed and/or generated in the project the following elements:

- 1) Title of Dataset, referred to the WP and Task
- 2) Dataset reference and name: Internal project Identifier for the data set to be produced.
- 3) WP and Task name;
- 4) Task and Data Manager: name of the organisation responsible for the Task;
- 5) Availability: Private, Consortium or PU - Public;
- 6) Status: planned, in progress, completed;
- 7) Mandatory Metadata: European Union, Horizon Europe, ZEAS, Innovation, Maritime;
- 8) Specific Dataset metadata: Keyword(s) that categorise data to make it linked/searchable;
- 9) Dataset description: description of the data generated or collected, including its origin (in cases where data is collected), nature and scale and to whom it could be useful, and whether it underpins a scientific publication. Information on the existence (or not) of similar data and the potential for integration and reuse;
- 10) Standards and metadata: reference to existing suitable standards in topic area governing data collection, aggregation, storage and sharing;
- 11) Data sharing: description of how data will be shared, including access procedures, embargo periods (if any), outlines of technical mechanisms for dissemination and necessary software and other tools for enabling reuse, formats;
- 12) Identification of the repository where data will be stored, if already existing and identified, indicating the type of repository (institutional, standard repository for the discipline, etc.). In cases where the dataset cannot be shared, the reasons for this will be stated (e.g., ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related).
- 13) Archiving and preservation (including storage and backup): description of the procedures to be put in place for long-term preservation of the data, including an indication of how long the data should be preserved, the approximate end volume, associated costs, and how these are planned to be covered.

A template for the Dataset by WP/Task has been drafted (see below in the FAIR Section).

1.3 Types and formats of data generated/collected

We have to highlight that we do not provide, collect or share the data related to the bio-medical ethics: genetic data, personal data concerning health, biological samples, animal tissue samples, etc. ZEAS will collect and generate data from several project-related activities.

These include:

| D. No. | Deliverable name | WP | D. Lead | Type | Dissemination Level |
|---------------|--|-----------|----------------|-------------|----------------------------|
| D1.1 | Project Management Handbook | WP1 | LDCK | R | PU |
| D1.2 | Risk Management Plan | WP1 | LDCK | R | PU |
| D1.3 | Data Management Plan | WP1 | Gitone | DMP | PU |
| D1.4 | Quality Assurance manual | WP1 | LDCK | R | PU |
| D2.1 | Ship feasibility study package | WP2 | PFRI | R | PU |
| D2.2 | Ship outline specification package | WP2 | LDCK | R | SEN |
| D2.3 | Ship Final Design package | WP2 | LDCK | DEM | SEN |
| D2.4 | Ship Hydrogen Powertrain Final Design package | WP2 | TECO | DEM | SEN |
| D2.5 | Vessel certification package | WP2 | LDCK | R | PU |
| D3.1 | H2 infrastructure concepts for assessment | WP3 | TU Chemnitz | Other | SEN |
| D3.2 | Final H2 infrastructure concept | WP3 | HyCentA | R | SEN |
| D3.3 | Conceptual design of H2 infrastructure and on-shore HRS | WP3 | HyCentA | R | SEN |
| D3.4 | Final design specification of H2 infrastructure and on-shore HRS | WP3 | HyCentA | R | SEN |
| D3.5 | Demonstration of H2 shuttle ship in real environment | WP3 | HyCentA | DEM | SEN |
| D4.1 | Ship smart digitalization study report | WP4 | ZenLab | R | SEN |
| D4.2 | Ship digital technology package | WP4 | MCoE | Other | SEN |
| D5.1 | Environmental and Social Impact | WP5 | HUV | R | PU |

| D. No. | Deliverable name | WP | D. Lead | Type | Dissemination Level |
|--------|--|-----|---------|------|---------------------|
| | Assessment (ESIA) | | | | |
| D5.2 | Life Cycle Assessment for hydrogen-powered ship | WP5 | TA | R | PU |
| D5.3 | Good environmental practice manual for hydrogen powered ships | WP5 | TA | R | PU |
| D5.4 | HAZID with risk register and quantitative risk analysis | WP5 | SCAN | R | PU |
| D6.1 | Dissemination, exploitation and communication plan | WP6 | Gitone | R | PU |
| D6.2 | Specific exploitation plan for each KER | WP6 | Gitone | R | SEN |
| D6.3 | Report on the commercial feasibility assessment studies | WP6 | MCoE | R | SEN |
| D6.4 | Report on synergies with other initiatives | WP6 | Gitone | R | PU |
| D6.5 | Final report on dissemination, exploitation and communication plan | WP6 | Gitone | R | PU |

Type of the data legend:

DMP - Data Management Plan
R - Document, Report

Dissemination level legend:

PU – Public
SEN - Sensitive

Some of the data the project will collect and generate are classified as personal data.

Participants in the project activities will use MS Office SharePoint repository to upload different types of documents with different personal or technical data.

The potential data collected in ZEAS can be grouped according to the following categories (All data marked with “*” are or may be considered “personal data” according to GDPR Art. 4)

Research data

1. Statistical data including, but not limited to, socio-economic, environmental, demographic data;
2. Audio, visual, audio-visual recordings (*);



3. Photographs (*);
4. Data generated from project activities;
5. Stakeholders and networks' mapping data and discussions results (*);
6. Statistics on the attendance to physical and online meetings, workshops and other events and initiatives organised in the framework of ZEAS activities;
7. Online data analytics such as website cookies, website visits, social media statistics, etc. (*);
8. Biographical data (e.g., age, education, job, family status, etc.) of participants to any kind of data-gathering activities (*).

Contact and administrative data

1. Personal and contact data such as name, surname, company address, phone number, email (*);
2. Administrative, financial, and other professional and/or business-related information (e.g., clients, participants from events, etc.) from companies, local stakeholders in the maritime and related sectors (*);
3. Consent forms (*).

Project Management and Consortium Coordination data

1. Contact information of partners' staff members including name, surname, office address, email address, telephone number (*);
2. Partners' project-related costs and expenditure;
3. Reports on partners' activities and achievements;
4. Audio-visual recordings of online meetings (*);
5. Meeting minutes report;
6. Meetings' participant lists (*).

In addition to the aforementioned categories, ZEAS will also collect, store and process personal data through its ZEAS MS Office SharePoint, referring to the participants invitation, following the Terms and Conditions and Privacy Policy.

1.3.1 Data formats

A dataset can include different types of formats.



As an example, a manually collected dataset can consist of written assessments, interviews, workshops notes, audio/video files from meetings, assessments, 3D models, other digital subjects and pictures.

ZEAS will mainly use widely accepted formats for data generation:

1. Documents/Reports/Publications: PDF/A, txt, doc/docx, ppt or equivalent
2. Plans and schematics: dwg
3. Spreadsheets: xls/xlsx or equivalent
4. Databases: csv or equivalent
5. Audio files: mp3, wav, wma, ra or equivalent
6. Pictures: jpg, png or equivalent
7. Video: avi, flv, mov, mp4, wmv or equivalent
8. Source codes, numerical models, graphical models
9. Others might be considered along the course of the project, and included in the next versions of the DMP.

1.4 Reuse and origin of existing data

ZEAS will also refer to already existing knowledge and datasets. In doing so, project partners will mainly rely on the following sources, amongst others:

- Papers, articles, and other desk research resources;
- Relevant links, photography, research and/or websites;
- Data gathered and/or generated in the context of previous/current projects in which ZEAS partners are involved;
- Data/information provided by members of ZEAS network of stakeholders.

While it is envisaged that most data collected will be open access and widely disseminated, some results of the project (particular WP2 – Hydrogen-powered ship design and construction and WP3 – H2 distribution, storage and bunkering) are treated as Sensitive and therefore may need to be protected due to IP rights. The background knowledge of each partner and access rights for different results are given in Consortium Agreement (CA), Attachment 1. and regarding the exploitation of results, there is currently no plan to exploit the information other than in the sense of maximizing communication and dissemination actions to the benefit of the project goals.

1.5 Expected size of the data

The overall size of data is currently not quantifiable. However, it is expected that the generated data will be of significant size, since it will contain designs in different formats, numerical results, models, large studies and different types of high-quality photographs. Therefore, we predict that a large online repository (both SharePoint and website) will be needed, which will be communicated with the service provider.

1.6 Data utility

Data and information collected by ZEAS are aimed to develop a hydrogen-powered ship, through a set of jointly designed and implemented actions that will support the digital and green transitions towards decarbonization of the maritime and connected industries.

The main goal of the project is to contribute to accelerating the shift to safe use of sustainable climate neutral fuels in waterborne transport through a full scale on board operational demonstration of a new system powered by hydrogen fuel cells with maritime applications.

Information gathered will help identify challenges in the areas related to Maritime and serve also as an input for policy design at national and European level. Finally, the data will inform the wider public about the project developments and the use of advanced technologies in maritime sector, which can provide huge improvements in existing maritime industry in partner countries, but the whole EU as well.

2 FAIR DATA

ZEAS will manage data according to the principles of FAIR data management (Findable, Accessible, Interoperable and Re-usable data).

The Consortium aims at maximising the access to, and the re-use of data generated by the project.

This Section describes how ZEAS will adopt each of the FAIR data management principles.

2.1 Making data findable, including provision of metadata

ZEAS will use the ZEAS MS Office SharePoint repository as the main tool to make research data findable in accordance with the H2020 Open Access guidelines. In doing so, the project will ensure that each document and data set shall be uniquely identifiable.

Each deliverable and data set must be associated to a unique document name to ensure version control.

The deliverable and data identifier must be used in the deliverable filename.



- **The draft versions of the deliverables** will be uploaded to ZEAS SharePoint in editable versions named as follows: *ProjectAcronym_DeliverableOfficialNo._Deliverable Official Name_Version* (e.g. ZEAS_D1.1DataManagementPlan_1). **The final deliverable after the completion of peer-review** will be uploaded to ZEAS MS Office SharePoint in non-editable version (pdf) named as follows: *ProjectAcronym_Deliverable Official No._DeliverableOfficialName* (e.g. ZEAS_D1.1_DataManagementPlan). The Project Coordinator will store all submitted final deliverables in the dedicated folder “GENERAL / 03_Deliverables_final”, within the ZEAS MS Office SharePoint.
- Specific keywords will be assigned to each dataset;
- Bibliographic metadata will be in a standard format and will include all the following:
 - o the terms “European Union (EU)” and “Horizon Europe”;
 - o the name of the action, acronym, and grant number;
 - o the publication date, and length of embargo period, if applicable;
 - o a persistent identifier.

The Confidential project datasets and reports will be hosted on the ZEAS Consortium private file sharing folder in SharePoint, which allows secure data share across partners. This area provides a space for information exchange and an archive for all the documentation produced along the Project lifespan.

In addition, individual partner’s institutional online repositories will host and preserve data until the end of the project.

2.2 Making data openly accessible

To maximise the impact of ZEAS data, the results are shared within and beyond the Consortium.

The ZEAS project datasets are first stored and organised in a database by the data owners (personal computer, or on the institutional secure server) and on the project database (SharePoint).

Important data focused on project objectives, promotion materials, events notifications will be made available through the ZEAS webpage (www.projectzeas.eu).

Selected data and results will be shared with the relevant stakeholders through publications, presentations at workshops/conferences, and social medias of partners.

While it is envisaged that most data collected will be open access and widely disseminated, some results of the project will be protected.

All data are made available for verification and re-use, except the results and data treated as Sensitive and are described in CA for each partner separately. The task leader can also justify why data cannot be made openly accessible or have limited access.

To protect the copyright of the project knowledge, Creative Commons license will be used in some cases.

As above mentioned, ZEAS will mainly use widely accepted formats for data generation, hence data will be accessible using the most common software tools.

Additionally, if applicable and available, project partners will commit to submit publications to conferences, journals, books based on their work in the project allowing open access to the published content, following the Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020, through “Green” or “Gold” model.

2.3 Making data interoperable

Data will be collected and shared using a standard format. As required, reference will be made to any software needed to run it.

In some cases, specific data will be used as originals (metadata, innovative data). This data can accessible under the conditions of the data owner. The data can be transformed into readable format for the external users.

Barriers to access through interoperability issues are not anticipated.

As the project progresses and data are identified and collected, further information on making data interoperable will be outlined in subsequent versions of the DMP.

A draft metadata form is set out below and this is subject to review in the next DMP update:

| WPXX, Task XX Dataset (Title of Dataset) | |
|---|---|
| Dataset reference / name | Dataset name |
| WP and Task Name | Name of the Task as it mentioned in the description |
| Task & Data Manager | Name of Task leader/data manager (Organisation) |
| Availability | Private, Consortium or Public |
| Status | Planned, in progress or completed |
| Mandatory metadata | European Union, Horizon Europe, STAGE, Sustainable Transition |
| Dataset Specific Metadata | Keyword(s) that categorise data to make it linked/searchable |
| Dataset description | Data description, origin, nature, scale, if it underpins a publication, who useful to, existence of similar data, possibilities for reuse |
| Standards | Reference to existing standards in topic area governing data |



| | |
|------------------------------|---|
| | collection, aggregation, storage and sharing |
| Data sharing | How the data will be shared, identification of repository, existence of embargo period if any, identification of software or tools necessary for reuse, format |
| Identification of repository | Where data will be stored, if already existing and identified: type of repository (institutional, standard repository for the discipline, etc.). If dataset cannot be shared, explain why (e.g., ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related) |
| Storage/backup | The procedure for long-term preservation, length of preservation, an estimation of costs and how this will be covered |

2.4 Increase data reuse

Dissemination and Exploitation plan will be drafted in M6 and finalized in M48, in collaboration with the project partners, to also tackle the correct knowledge management and re-use of the data during the project and beyond.

At the current stage, unless specifically decided by the Consortium, all project results, etc. will be treated as open access, uploaded to the ZEAS website, partners websites, published at social medias, conferences, SCI papers. As stated before, some of the original results and technical solutions from project are specific and require dedicated scientific tools to be opened or used. Some files, but not all, can be transferred into text to become visible and ready to use in other tools. In some cases, the developments can be saved as executable version, which can be used as technology demonstrators.

All non-software deliverables of the project will be licensed as Creative Commons where this is legally possible, except for specific publications that will have to comply with licensing terms and rights, following the Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020.

Where applicable for media, all these deliverables and achievements will be placed also on partners web pages and social medias for easy promotion and reuse.

Moreover, the data produced and/or used in the project will be useable by ZEAS partners and by third parties after the end of the project in line with individual agreements and limitation defined by each partner for particular data. The usage of this data will be specified within the D6.2 Specific exploitation plan for each KER, in M36, with specific focus on activities and implementation after the project activities end.

Restrictions on re-use policy are applied for all protected data (Sensitive), whose re-use will be limited within the project partners.

Further specifications will be added in the next version of this DMP.



Regarding the quality assurance process, D1.4 Quality Assurance manual will set the guidelines, which contain:

- Supply methods, standards and procedures adapted to the specific project objectives, including:
 - Organisation of the implementation team(s);
 - Roles and responsibilities of each participant;
 - Time schedules definition, implementation, monitoring and control;
 - Quality criteria for deliverables, publications and reports;
 - Quality criteria for software development and testing;
 - Procedures for evaluation, acceptance, and quality control;
- Assist and advise the project team in its effort of producing results of highest quality;
- Identify and exercise controls enabling a continuous and critical overview on the project progress regarding the project's objectives.

3 ALLOCATION OF RESOURCES

In the ZEAS project no extra costs are foreseen for making FAIR the project's data.

The activities related to making the data/outputs open access are covered within the allocated budget for each WP.

The Project Coordinator will assist/support partners in complying with GDPR regulation when necessary.

The Project Coordinator acts as Quality and Data Manager (QDM), in collaboration with consortium partners, to manage the data generated during the project.

The QDM will identify an appropriate data repository to store and safeguard the datasets and ensure that data are readily accessible. First, the local data repository can be used at partners and MS Office SharePoint can be used as final repository for crucial data and results.

The Communication, Dissemination and Exploitation Manager, in collaboration with consortium partners, will oversee the identification of which datasets will be disseminated and the most appropriate means of disseminating these data.

Additional details will be reported in the future versions of the DMP, if needed.



Resources for long term preservation, associated costs and potential value, as well as how data will be kept beyond the project and how long, will be discussed by the Consortium in the next meetings.

4 DATA SECURITY

Data security refers to protective digital privacy measures, applied to prevent unauthorised access to servers, computers, websites, and any other kind of data repositories put in place by project partners.

According to GDPR Data Controller is “a natural or legal person, public authority, agency, or other body which alone or jointly with others determines the purposes and means of processing personal data”.

The Data Controller is responsible for ensuring that data is processed in compliance with the principles of lawfulness, fairness, transparency, data minimization, accuracy, storage limitation, integrity, and confidentiality. Furthermore, under GDPR, a data processor is as “a natural or legal person, public authority, agency, or other body which processes personal data on behalf of a controller”.

In the context of ZEAS, LDCK as Lead Partner, provides the overall framework to facilitate partners in complying with the legal and ethical requirements of data protection. LDCK will have the responsibility to store the bulk of the collected data.

Each ZEAS project partner is fully responsible for guaranteeing that data will be stored securely and safely, to ensure confidentiality, integrity and availability of data.

Each partner is responsible for the data collected within its own activities, in its capacity of Data Controller, and must ensure that they are secured and stored safely and adequately processed.

Each partner is responsible for the use of personal data through ZEAS project’s channels (website, social media pages). Data will be shared only after explicit, written consent of the data owner or their legal representative (see above).

All project deliverables, and those project data considered sharable by Data Controller, will be stored, and shared in the OPR - Official Project Repository (OPR – MS Office SharePoint) restricted to the project consortium partners.

4.1 Data access and storage

The project has three main levels of data storage and sharing facilities according to the type of data and its intended accessibility.

- **Private:** Data are stored locally by each partner, subject to institutional back up practices.

- **Consortium:** The Project Coordinator will host a common space on web (LDCK Ms Office SharePoint), which is accessible to all project partners. Consortium data will be uploaded to this cloud storage for simple, secure access for all partners from within a web browser.
- **Public:** The main facility that will be used during the project is the ZEAS website / Platform www.projectzeas.eu managed by Gitone, will be the first point of contact for public dissemination and promotion of the project. It will be reachable from every partner website through plug-in or ZEAS website link. It will host project description, main objectives, main updates about ZEAS events and innovation actions. The important news and results will be published at ZEAS or partners social medias.

Personal data will be collected by each project partner (Data Controller) through assessments, interviews, workshops, focus groups, and any other activity involving volunteer participants to ZEAS activities.

Participants will be informed, as part of the consent process, of the purpose(s) of data collected.

There will be appropriate backups (LDCK local repository) and firewall protection (protection of local and cloud-based repositories guaranteed by LDCK). The public and consortium data will be stored and available 5 years after the project end. The private type of data will be available and protected by LDCK during the project duration, after the project, the data is restricted to owners and partners.

These data will be used for research purposes only, and the ZEAS Consortium will hold the data for the time of research, project duration and after project duration as it is stated in CA, and as for long as the scientific community can benefit from this data, according to FAIR principles (5 years after the project duration).

Personal data meant to be shared outside the Data Controllers' servers, will be made public only under a consent form signed by the individual, to which the data belongs.

5 ETHICAL ASPECTS

The GDPR will be respected for all relevant personal data collected. When the project involves access by the partners to personal data, the partners shall be regarded as responsible for treatment of said data and shall comply with rules.

All partners will assure that the EU standards regarding ethics and data management are fulfilled.

Templates for informed consent forms and information sheet will be made available.

More details in relation to Ethics (and Security) in relation to Data Management can be found in ARTICLE 13 — CONFIDENTIALITY AND SECURITY and ARTICLE 14 — ETHICS AND VALUES of the GA.



6 CONCLUSIONS

This document introduces the first plan for ZEAS Data Management, identifies the datasets criteria of data that will be generated or collected, and describes how they will be stored and shared.

It specifies the level of dissemination, as far as possible, for the time being.

In addition, repositories for managing and sharing data are identified.

ZEAS Data Management plan will be updated with more details in M24 (for internal storage in SharePoint). The final version will be issued at the end of the project in M48.



7 REFERENCES

- [1] Guidelines on Data Management in Horizon 2020
- [2] Annotated Model Grant Agreement - Open access to research data
- [3] Template for the Data Management Plan
- [4] ZEAS website: www.projectzeas.eu (in preparation), functional by end of 2024



CONSORTIUM PARTIES



ANNEXES

Dataset Template: data collected per each WP and Task

The datasets will be implemented by the WP leaders along the course of the project and included in the next editions of the DMP.

| WPXX, Task XX Dataset (Title of Dataset) | |
|---|---|
| Dataset reference / name | Dataset name |
| WP and Task Name | Name of the Task |
| Task & Data Manager | Name of Task leader/data manager (Organisation) |
| Availability | Private, Consortium or Public |
| Status | Planned, in progress or completed |
| Mandatory metadata | European Union, Horizon Europe, STAGE, Sustainable Transition |
| Dataset Specific Metadata | Keyword(s) that categorise data to make it linked/searchable |
| Dataset description | Data description, origin, nature, scale, if it underpins a publication, who useful to, existence of similar data, possibilities for reuse |
| Standards | Reference to existing standards in topic area governing data collection, aggregation, storage and sharing |
| Data sharing | How the data will be shared, identification of repository, existence of embargo period if any, identification of software or tools necessary for reuse, format |
| Identification of repository | Where data will be stored, if already existing and identified: type of repository (institutional, standard repository for the discipline, etc.). If dataset cannot be shared, explain why (e.g., ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related) |
| Storage/backup | The procedure for long-term preservation, length of preservation, an estimation of costs and how this will be covered |

