# D1.5. Data Management Plan

## FLEXBY

### FLEXIBLE AND ADVANCED BIOFUEL TECHNOLOGY THROUGH AN INNOVATIVE MICROWAVE PYROLYSIS & HYDROGEN-FREE HYDRODEOXYGENATION PROCESS

Grant Agreement Number 101144144

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## DOCUMENT CONTROL PAGE

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*All the contributors to this deliverable declare that they:*

▪ *Are aware that plagiarism and/or literal utilisation (copy) of materials and texts from other Projects, works and deliverables must be avoided and may be subject to disciplinary actions against the related partners and/or the Project consortium by the EU.*

▪ *Confirm that all their individual contributions to this deliverable are genuine and their own work or the work of their teams working in the Project, except where it is explicitly indicated otherwise.*

▪ *Have followed the required conventions in referencing the thoughts, ideas and texts made outside the Project.*

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# EXECUTIVE SUMMARY

Deliverable D1.5 Data Management Plan outlines the foundational data management strategies for the FLEXBY project. This document will undergo regular updates throughout the project's duration, with new versions included in the Technical Reports after each Reporting Period at M18, M30, and the most updated version as a Deliverable "D1.6 Updated Data Management Plan" in M48.

FLEXBY aims to work under a more global open scientific strategy with a cultural transition toward openness, accessibility, reusability, transdisciplinary, participatory collaboration, and a methodology driven by the benefit for society since HEU seeks to sponsor ground-breaking research. The HEU Communication, Dissemination, Open Science, and Visibility policy is upheld by FLEXBY partners and is outlined in the Programme Regulation (Article 14 and 39(3)) and the General Model Grant Agreement. In light of this, it provides details about the various datasets collected and used within the project for consortium partners as well as for third parties.

The deliverable identifies and enumerates the various datasets used in the project, detailing the technical aspects of data collection, processing, and generation. It also specifies the standards and methodologies applied to the different datasets. Additionally, it addresses the data dissemination levels in terms of open access and outlines the duration for which the data will be curated and preserved.

To achieve this, the document is structured into sections that align with the Horizon Europe Data Management Plan Template[1].

[1] European Commission, 'Template Horizon Europe Data Management Plan, April 2022': https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/report/data-management-plan_he_en.docx

# 1. INTRODUCTION

## 1.1 DESCRIPTION OF THE DOCUMENT AND PURSUE

The purpose of this document is to present and detail the Data Management Plan (DMP) for the FLEXBY project. The DMP is a crucial document that outlines the management policies for the data generated during the FLEXBY project. Its primary goal is to provide a comprehensive overview of how the project's data will be handled, stored, and shared throughout its lifecycle. The DMP serves as an essential guideline to ensure data is managed efficiently and effectively, while also complying with relevant regulatory requirements.

The DMP encompasses a wide range of information and data management policies vital to the FLEXBY project's success. It includes identifying the data generated during the project and details on how this data will be collected, processed, analyzed, and stored. Additionally, the document outlines procedures for data sharing and dissemination, taking into account the project's Intellectual Property (IP) considerations. A key principle guiding the FLEXBY project's data management activities is "as open as possible, as closed as necessary." This principle emphasizes the importance of Open Access to data and its benefits to the scientific community, while also recognizing the need to restrict or close data to protect intellectual property or other sensitive information.

This deliverable has been created using the information and template provided by the European Commission[1]. As this is the first version, some data details cannot be specified at this stage. Therefore, certain fields regarding the datasets will be marked as **'not known at the moment**' or **'N/A'**. To address this, two additional official versions will be submitted by IDE to the European Commission at the end of each reporting period (M18, M36) and a last one as an updated of the Data Management Plan (Deliverable 1.6) in M48:

Moreover, this document will be reviewed by the consortium at each Consortium Meeting (every six months) to ensure it remains current and compliant with the European Commission's requirements. Consequently, this deliverable is considered a ***living document***, subject to continuous updates, including but not limited to:

- ✓ New data or updates
- ✓ Changes in consortium policies (e.g., innovation potential, decision to file for a patent)
- ✓ Changes in consortium composition and external factors (e.g., new members joining or existing members leaving)

## 1.2 WPS AND TASKS RELATED WITH THE DELIVERABLE

This deliverable refers to Task 1.5 included in WP1: Project Management. This deliverable, led by IDE, accounts also with the collaboration of the rest of the partners from the FLEXBY project. All the definitions of datasets and experimental results to be collected, processed, and/or generated in the complete project life cycle have been identified, analysed and defined for all the partners.

## 2. DATA SUMMARY

The following tables show a summary of the most relevant information included for each dataset and each partner. The FLEXBY consortium has analyzed and designed their preliminary data usage in detail and created 21 Datasets:

| PARTNER: IDE – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Data for model validation |
| **Dataset description** | In this dataset, the experimental data generated and gathered during the project will be used for the validation of the models. |
| **Purpose of the Data** | Model validation, the definition of input and output streams, the definition of operational conditions |
| **Type of Data** | Reused data |
| **Form of the data** | Results from experiments and pilots' performance |
| **Format of the data** | PDF/A, Plain text |
| **Origin of the data** | Data gathered from involved partners of the consortium |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: IDE – FLEXBY-Dataset #2 | |
|---|---|
| **Identifier** | Engineering documentation |
| **Dataset description** | Process blueprints for technology implementation, PFD, M&EB, P&ID, plot plan |
| **Purpose of the Data** | Technology implementation into industry and products integration |
| **Type of Data** | Engineering documentation |
| **Form of the data** | New data |
| **Format of the data** | PDF/A |
| **Origin of the data** | Developed by IDE |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: KNEIA – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | FLEXBY website user personal data |
| **Dataset description** | Website user name and email addresses |
| **Purpose of the Data** | Correspondence |
| **Type of Data** | Personal data |
| **Form of the data** | New data |
| **Format of the data** | Text format stored in project email inbox |
| **Origin of the data** | Contact form on Flexby website |
| **Dataset is:** | To be generated |

| PARTNER: CSIC – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Physic-chemical characterisation of different industrial biomass waste (two oily sludge from the Dairy industry, two sludge from macroalgae processing and two samples of microalgae). |
| **Dataset description** | Experimental data on the physic-chemical characterisation of biowaste, analysed and/or collected by CSIC during the first months of the project. |
| **Purpose of the Data** | The experimental data will be used to assess the suitability of the bio-wastes for the subsequent pyrolysis processes.. |
| **Type of Data** | Analytical data obtained from the physico-chemical characterisation (moisture, ash, volatile matter, ultimate analysis, ash fusibility, etc.) of the biowastes |
| **Form of the data** | Results from the experiments (numerical data, graphs, etc.) |
| **Format of the data** | PDF/Excel file |
| **Origin of the data** | Data from CSIC, a partner in the consortium |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: CSIC – FLEXBY-Dataset #2 | |
|---|---|
| **Identifier** | Conventional pyrolysis of the industrial biomass waste (two oily sludge from the Dairy industry, two sludge from macroalgae processing and two samples of microalgae). |
| **Dataset description** | Experimental data on the yields of the three pyrolysis fractions (biochar, bio-oil and gas) and experimental data on the physic-chemical characterisation of these fractions. Analysed and collected by CSIC. |
| **Purpose of the Data** | The experimental data will provide insight into the behaviour of biomass waste (sewage sludge and microalgae) in the electrical conventional furnace. The effect of different experimental pyrolysis variables on the results of the materials obtained will be studied. The thermal process will be optimised to obtain the highest yield in the liquid fraction (bio-oils). |
| **Type of Data** | Analytical data obtained from the conventional pyrolysis |
| **Form of the data** | Results from the experiments (numerical data, graphs, etc.) |
| **Format of the data** | PDF/Excel file |
| **Origin of the data** | Data from CSIC, a partner in the consortium |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: CSIC – FLEXBY-Dataset #3 | |
|---|---|
| **Identifier** | Microwave pyrolysis of the industrial biomass waste (sewage sludge and microalgae). Comparison of the results of microwave pyrolysis with those of conventional pyrolysis. |
| **Dataset description** | Experimental data on the yields of the three pyrolysis fractions (biochar, bio-oil and gas) and experimental data on the physic-chemical characterisation of these fractions. Analysed and collected by CSIC. |
| **Purpose of the Data** | The experimental data will provide insight into the behaviour of biomass waste (sewage sludge and microalgae) in the microwave pyrolysis process. The effect of different experimental pyrolysis variables on the results of the materials obtained will be studied. The thermal process will be optimised to obtain the highest yield in the liquid fraction (bio-oils). |
| **Type of Data** | Analytical data obtained from the microwave-pyrolysis of the biomass waste. |
| **Form of the data** | Results from the experiments (numerical data, graphs, etc.) |
| **Format of the data** | PDF/Excel file |
| **Origin of the data** | Data from CSIC, a partner in the consortium |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: FRIMA – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Simulation model of the microwave pyrolysis |
| **Dataset description** | Report on the basic design of the microwave pyrolysis, based on the dimension of the applicator and the design, as well as the position of the microwave coupling system. |
| **Purpose of the Data** | Microwave heating process simulation |
| **Type of Data** | Document, report, other. |
| **Form of the data** | CST Studio Suite 3D-EM-Simulations, using data from CSIC (T2.1) |
| **Format of the data** | PDF/A, Plain text |
| **Origin of the data** | Developed by FRIMA |
| **Dataset is:** | To be generated |

| PARTNER: FRIMA – FLEXBY- Dataset #2 | |
|---|---|
| **Identifier** | Microwave pyrolysis assembling and testing |
| **Dataset description** | The microwave designed and assembled by FRIMA will be sent to CSIC´s facilities to perform the experiments at lab-scale. The maximum power input of the testing system will be 3kW. |
| **Purpose of the Data** | The treatment capacity, temperature, power, heating rate, type of microwave absorber will be established as potential variables and constants for the experiments. |
| **Type of Data** | Document, report, other. |
| **Form of the data** | New data |
| **Format of the data** | PDF/A, Plain text |
| **Origin of the data** | Developed by FRIMA |
| **Dataset is:** | To be generated. |

| PARTNER:GD– FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Preliminary Life Cycle Assessment (LCA) of FLEXBY |
| **Dataset description** | Preliminary LCA model that will be obtained within M12 as part of WP7 tasks. |
| **Purpose of the Data** | The preliminary LCA model will act as a guideline for evaluating potential environmental, economic, and social impacts. It will offer an initial framework for understanding life cycle effects and aid in early-stage decision-making before experimental data is collected. |
| **Type of Data** | Document, report, other |
| **Form of the data** | Reporting the results of the preliminary LCA |
| **Format of the data** | PDF/A |
| **Origin of the data** | Data will be gathered from public and commercial databases, alongside scientific publications and technical reports from policy documents. |
| **Dataset is:** | In phase of definition and documentation of variables. |

| PARTNER:GD– FLEXBY-Dataset #2 | |
|---|---|
| **Identifier** | Data collection sheet WP7 sustainability assessment |
| **Dataset description** | The document will be obtained in collaboration with all the other partners, during the whole length of the project. |
| **Purpose of the Data** | The majority of the data collected throughout the project will be provided or generated by other partners in the consortium, and will be managed according to their confidentiality agreements and data management strategies. All relevant data will be used to evaluate the overall environmental sustainability of the modelled biofuel along with its economic viability and profitability. |
| **Type of Data** | Document, report, other |
| **Form of the data** | Excel spreadsheet. |
| **Format of the data** | .xlsx or .csv |
| **Origin of the data** | The data is primarily sourced from contributions by other partners in the consortium, with additional data coming from public and commercial databases, scientific publications, and policy technical reports. |
| **Dataset is:** | In phase of definition and documentation of variables. |

| PARTNER:GD– FLEXBY-Dataset #3 | |
|---|---|
| **Identifier** | Environmental Life Cycle Assessment (eLCA) and Life Cycle Costing (LCC) of FLEXBY |
| **Dataset description** | eLCA and LCC models that will be obtained within M44 as part of WP7 tasks. |
| **Purpose of the Data** | The model in openLCA will be populated with values from the collected data, with the purpose to evaluate the environmental and economic performance of FLEXBY. |
| **Type of Data** | eLCA and LCC report based on the model developed using data provided by the partners in the FLEXBY consortium. |
| **Form of the data** | Report with the results of the environmental LCA |
| **Format of the data** | PDF/A |
| **Origin of the data** | The model will be based on the data collected in dataset #2, which is primarily sourced from contributions by other partners in the consortium, with additional data coming from public and commercial databases, scientific publications, and policy technical reports. |
| **Dataset is:** | In phase of definition and documentation of variables. |

| PARTNER:GD– FLEXBY-Dataset #4 | |
|---|---|
| **Identifier** | Social Life Cycle Assessment (sLCA) of FLEXBY |
| **Dataset description** | sLCA models that will be obtained as part of WP7 within M44. |
| **Purpose of the Data** | The model in openLCA will be populated with values from the collected data, with the purpose to evaluate the social performance of FLEXBY. |
| **Type of Data** | sLCA report based on the model developed using data provided by the partners in the FLEXBY consortium. |
| **Form of the data** | Report with the results of the social LCA |
| **Format of the data** | PDF/A |
| **Origin of the data** | The model will be based on the data collected in dataset #2, which is primarily sourced from contributions by other partners in the consortium, with additional data coming from public and commercial databases, scientific publications, and policy technical reports. |
| **Dataset is:** | In phase of definition and documentation of variables. |

| PARTNER: A4F – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Microalgae identification |
| **Dataset description** | Characteristics of prevalent microalgae species in wastewater treatment systems |
| **Purpose of the Data** | To identify the predominant microalgae species that grow in wastewaters for assessing the potential as biofuel feedstock |
| **Type of Data** | Pictures taken with a microscope |
| **Form of the data** | Photographs |
| **Format of the data** | .JPG files |
| **Origin of the data** | A4F's laboratory |
| **Dataset is:** | To be generated |

| PARTNER: A4F – FLEXBY-Dataset #2 | |
|---|---|
| **Identifier** | Monitoring data of microalgae cultivation at pilot scale |
| **Dataset description** | Experimental data gathered during one year of operation of the pilot scale system in WP6 |
| **Purpose of the Data** | To monitor the performance of the microalgae cultivation system |
| **Type of Data** | Analytical data including physicochemical analysis of algae biomass and of the cultivation media (wastewater) |
| **Form of the data** | Numerical data and graphs |
| **Format of the data** | Excel file |
| **Origin of the data** | Lab analysis and online monitoring devices |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: US – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Catalytic Reactions data |
| **Dataset description** | Experimental data concerning reactions for biofuel production in both liquid and gas phase will be generated during the project. This set of data will be used to guide the design of FLEXBY´s pilot plant |
| **Purpose of the Data** | Catalytic Reactions optimisation to maximise biofuel production |
| **Type of Data** | Original data |
| **Form of the data** | Results from experiments and pilots' performance |
| **Format of the data** | Excell, Origin, PDF/A, Plain text |
| **Origin of the data** | Data gathered from US lab-scale reactors |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: US – FLEXBY-Dataset #2 | |
|---|---|
| **Identifier** | Catalysts Physicochemical Characterisation |
| **Dataset description** | Experimental data concerning physicochemical properties of the catalytic materials implemented on FLEXBY´s chemical reactions. This set of data will be used to guide the design of optimal catalysts. |
| **Purpose of the Data** | Understanding physicochemical features of the catalytic materials to refine formulation and prevent catalysts deactivation |
| **Type of Data** | Original data |
| **Form of the data** | Results from experiments at US characterisation facilities (XRD, XPS, TGA, SEM, etc.) |
| **Format of the data** | Excell, Origin, jpg, PDF/A, Plain text |
| **Origin of the data** | Data gathered from US characterisation facilities |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: US – FLEXBY-Dataset #3 | |
|---|---|
| **Identifier** | Fuel Cell performance data |
| **Dataset description** | Experimental data concerning fuel cell performance as per indicated in project activities |
| **Purpose of the Data** | Understanding the potentential of the biofuels generated in FLEXBY to power a fuel cell |
| **Type of Data** | Original data |
| **Form of the data** | Results from experiments over commercial fuel cell´s devices provided by consortium partners |
| **Format of the data** | Excell, Origin, PDF/A, Plain text |
| **Origin of the data** | Data gathered at US laboratories |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted) |

| PARTNER: GALP – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Data for reaction product validation. |
| **Dataset description** | Experimental data obtained from analysis of produced fuels. |
| **Purpose of the Data** | Process and model validation. |
| **Type of Data** | Experimental data generated. |
| **Form of the data** | Results from analysis. |
| **Format of the data** | TBD |
| **Origin of the data** | Data obtained at GALP´s facilities and/or sub-contracted. |
| **Dataset is:** | Growing (new data may be added, but the old data is never changed or deleted). |

| PARTNER: PMI – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Datasheet of the process |
| **Dataset description** | Process data and operating conditions obtained from the simulation of the process's unit operations |
| **Purpose of the Data** | Digital twin development for process optimization and scale-up, KPIs assessment. |
| **Type of Data** | Process data |
| **Form of the data** | Datasheet of the overall process |
| **Format of the data** | PDF/A, .xlsx |
| **Origin of the data** | Process data obtained from process simulator software |
| **Dataset is:** | Growing (new data may be added or old data updated) |

| PARTNER: PMI– FLEXBY- Dataset #2 | |
|---|---|
| **Identifier** | Lab-scale process variables definition and simulation report |
| **Dataset description** | Report on the definition of the main process variables of the project at lab scale, including a general basic design and a process simulation |
| **Purpose of the Data** | This report aims to define the key process variables at the lab scale, provide a general basic design, and perform a process simulation to evaluate and optimize the system's performance. |
| **Type of Data** | Report |
| **Form of the data** | Results from simulations and estimations |
| **Format of the data** | PDF/A |
| **Origin of the data** | Developed by PMI |
| **Dataset is:** | Growing (new data may be added or old data updated) |

| PARTNER: CVE – FLEXBY-Dataset #1 | |
|---|---|
| **Identifier** | Questionaries for clustering activities |
| **Dataset description** | For the project clustering activities, it is possible that thematic workshops will be organised with further projects. Information such as name, e-mail address, affiliation will be asked for registration to those workshops |
| **Purpose of the Data** | Logistics of event organisation; engagement with stakeholders |
| **Type of Data** | Document |
| **Form of the data** | Tabled information |
| **Format of the data** | Excel file |
| **Origin of the data** | From the registration form created for the workshop |
| **Dataset is:** | To be generated |

# 3. FAIR DATA

This section presents how the FLEXBY consortium should save the information to make the data Findable, Accessible, Interoperable and Reusable (FAIR). IDE is accountable for administering the project repository and ensuring compliance with the DMP and FAIR standards:

FINDABLE principle emphasizes the importance of making research data easily discoverable and accessible to other researchers. All data files produced shall start with the name of the project “FLEXBY”. This can be achieved by assigning persistent identifiers, such as DOIs or URIs, to the data and providing comprehensive metadata that accurately describes the data's content and context. By doing so, researchers can easily search for and locate the data they need by using appropriate data repositories or catalogues, ultimately promoting data sharing and reuse.

ACCESIBLE principle asserts that data should be accessible to both humans and machines, with privacy, security, and legal considerations in mind. To achieve this, obstacles to data access should be eliminated, clear instructions for accessing the data should be provided, and open standards and protocols should be used to ensure seamless access. This approach allows researchers to access and utilize the data without unnecessary restrictions while protecting the privacy and security of the individuals whose data is shared. To facilitate easy access for third parties and researchers wishing to use or reproduce the data, standardized file formats are employed. The goal is to preserve and make both open and non-open data readily available to interested parties during and after the project.

INTEROPERABILITY principle highlights the necessity of organizing data to enable seamless combination and integration with data from various sources. This involves using standardized vocabularies, ontologies, and data models to ensure data can be accurately interpreted and exchanged across different systems. Open formats and APIs also play a crucial role in promoting interoperability, making it easier for researchers to access and integrate data into their work. Following these principles enhances the value and usability of data, fostering more effective collaboration and knowledge discovery.

REUSABILITY to ensure comprehensive documentation and proper description of the data. This includes providing details about its origin, context, and usage rights. Clear and standardized terms of use and licenses encourage others to reuse and cite the data effectively, promoting collaboration and reproducibility. Detailed documentation of the data collection process, data processing steps, and any assumptions or limitations is essential. Additionally, using standard data formats and metadata standards further supports data reuse and interoperability.

Based on FAIR´s principles, the following sections details the strategy that will be followed by each partner regarding their datasets.

## 3.1. IDE

**IDE-FLEXBY-Dataset #1**

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, and the public dataset will be included in the ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, it will be included in the ZENODO platform. |
| **Will all data and/or metadata be made openly available?** | As most of the data will come from the project partners, it will have to be agreed previously. |
| **How long will the data and/or metadata remain available and findable?** | No limit |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

| | |
|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided. |
| **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?** | The data agreed upon with the partners will be made freely available in the public domain to permit re-use. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

## IDE-FLEXBY-Dataset #2

| | |
|---|---|
| **FINDABLE** | |
| **Will data be identified by a persistent identifier?** | Yes, and the public dataset will be included in the ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, it will be included in the ZENODO platform. |
| **Will all data and/or metadata be made openly available?** | Due to the nature of the data (directly dependent on the feedback of technical partners) it will have to be agreed previously. |
| **How long will the data and/or metadata remain available and findable?** | No limit |

| | |
|---|---|
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes |
| **INTEROPERABILITY** | |
| **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?** | Data will be produced in different software formats (e.g, .dwg, step) and will be shared as pdf |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | N/A |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided. |
| **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?** | The data that will not hinder the exploitation of the results as direct use or IP will be made freely available upon the agreement with the partners. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

## 3.2. KNEIA

**KENIA-FLEXBY-Dataset #1**

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | No |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata will be created. The data will be handled in accordance with Regulation (EU) 2016/679, General Data Protection. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | No |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | No |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | No |
| **Will all data and/or metadata be made openly available?** | No |
| **How long will the data and/or metadata remain available and findable?** | N/A |
| **Will documentation or reference about any software be needed to access or read the data be included?** | N/A |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

| | |
|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | N/A |
| **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?** | No |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | No |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | N/A |

## 3.3. CSIC

### CSIC-FLEXBY-Dataset #1 #2 & #3

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, and the public dataset will be included on the ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | N/A |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Once the research results of the project are published in international scientific journals, they will be deposited on the ZENODO platform. |
| **Will all data and/or metadata be made openly available?** | It will have to be agreed previously and IP issues will be adressed |
| **How long will the data and/or metadata remain available and findable?** | No limit |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

| | |
|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided. |
| **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?** | The data agreed upon with the partners will be made freely available in the public domain to permit re-use. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

## 3.4. FRIMA

**FRIMA-FLEXBY-Dataset #1**

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, data will be identified by persistent identifiers such as ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A. |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, data will be deposited in ZENODO repository. |
| **Will all data and/or metadata be made openly available?** | Due to the nature of the data (directly dependent on the feedback of technical partners) it will have to be agreed previously. |
| **How long will the data and/or metadata remain available and findable?** | Data and metadata will remain available and findable for at least 10 years. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes, documentation on necessary software and tools will be provided. |
| **INTEROPERABILITY** | |
| **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?** | We will use standard vocabularies and formats such as RDF, XML, and JSON, adhering to relevant disciplinary standards. |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

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|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Comprehensive documentation will be provided, including methodology, data processing steps, and analysis protocols. |
| **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?** | The data that will not hinder the exploitation of the results as direct use or IP will be made freely available upon the agreement with the partners. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes, the data will be usable by third parties post-project. |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

**FRIMA-FLEXBY-Dataset #2**

| | |
|---|---|
| **FINDABLE** | |
| **Will data be identified by a persistent identifier?** | Yes, data will be identified by persistent identifiers such as ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, data will be deposited in a recognized and trusted repository such as Zenodo or institutional repositories. |
| **Will all data and/or metadata be made openly available?** | Yes, both data will be made openly available, except for any data restricted by confidentiality or privacy concerns. |

| | |
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| **How long will the data and/or metadata remain available and findable?** | Data will remain available and findable for a minimum of 10 years, and potentially longer, depending on repository policies. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes, documentation on any necessary software and tools, including versions and access instructions, will be provided. |
| **INTEROPERABILITY** | |
| **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?** | We will use standard vocabularies and formats such as RDF, XML, JSON, and disciplinary standards to ensure interoperability and data exchange across disciplines. |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | N/A. |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided |
| **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?** | Yes, data will be made freely available and licensed under standard reuse licenses such as Creative Commons, in line with the Grant Agreement obligations. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes, the data will be usable by third parties after the project ends, ensuring continued benefit and impact. |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

## 3.5. GD

### GD-FLEXBY-Dataset #1

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, the datasets will be assigned a unique UUID. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | LCA metadata, including process descriptions, dataset authors, locations, and modelling options, will be structured according to ISO 14040-14044 standards. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | No |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | Yes, metadata will be provided in a manner that facilitates harvesting and indexing. |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Data accessibility will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. It will be deposited in dedicated repositories designated by the consortium as part of the project's development activities. |
| **Will all data and/or metadata be made openly available?** | Data availability will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. |
| **How long will the data and/or metadata remain available and findable?** | N/A |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes, documentation on accessibility will be made available. |
| **INTEROPERABILITY** | |
| **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?** | Data will adhere to accepted LCA methodologies and metadata standards. Endorsed practices by entities such as SETAC will be followed, ensuring that the data is interoperable and facilitates data exchange and re-use within and across disciplines. |

| | |
|---|---|
| **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?** | Mappings to commonly used LCA nomenclatures will be provided if project-specific ontologies or vocabularies are generated. An ontology is not planned to be provided. Any generated ontologies or vocabularies will be openly published to enable reuse, refinement, and extension. |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | Yes, the data will include qualified references to other data sources, including data from the project itself and datasets from previous research, to ensure comprehensive context and enhance data quality. |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided.<br>The exact licensing will be determined by the business and exploitation strategy of the FLEXBY project. |
| **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?** | N/A |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes, the data will be usable by third parties after the project ends, ensuring continued benefit and impact. |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

## GD-FLEXBY-Dataset #2

| | |
|---|---|
| **FINDABLE** | |
| **Will data be identified by a persistent identifier?** | Data will be identified using both an internal identifier and standard, commonly used identifiers. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | Metadata will be created to connect values with their sources, identify experimental conditions, and include additional information based on the |

| | |
|---|---|
| | source. This metadata will follow relevant disciplinary and general standards as applicable. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | The description does not explicitly mention search keywords, but the provided metadata will facilitate connecting data with sources and conditions, which may enhance discoverability and re-use. |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | Yes, metadata will be structured to enable harvesting and indexing, ensuring that it is accessible and useful for data discovery and integration. |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Data accessibility will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. It will be deposited in dedicated repositories designated by the consortium as part of the project's development activities. |
| **Will all data and/or metadata be made openly available?** | Data availability will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. |
| **How long will the data and/or metadata remain available and findable?** | This is not decided yet. No plans to remove published data so far. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes, documentation on accessibility will be made available. |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

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|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | The exact licensing will be determined by the business and exploitation strategy of the FLEXBY project. |
| **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?** | N/A |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | N/A |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | N/A |

## GD-FLEXBY-Dataset #3

| | |
|---|---|
| **FINDABLE** | |
| **Will data be identified by a persistent identifier?** | Yes, the datasets will be assigned a unique UUID. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | LCA metadata, including process descriptions, dataset authors, locations, and modelling options, will be structured according to ISO 14040-14044 standards. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | No. |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | Yes, metadata will be provided in a manner that facilitates harvesting and indexing. |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Data accessibility will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. It will be deposited in dedicated repositories designated by |

| | |
|---|---|
| | the consortium as part of the project's development activities. |
| **Will all data and/or metadata be made openly available?** | Data availability will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. |
| **How long will the data and/or metadata remain available and findable?** | This is not decided yet. No plans to remove published data so far. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes, documentation on accessibility will be made available. |
| **INTEROPERABILITY** | |
| **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?** | Data will adhere to accepted LCA methodologies and metadata standards. Endorsed practices by entities such as SETAC will be followed, ensuring that the data is interoperable and facilitates data exchange and re-use within and across disciplines. |
| **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?** | Mappings to commonly used LCA nomenclatures will be provided if project-specific ontologies or vocabularies are generated. An ontology is not planned to be provided. Any generated ontologies or vocabularies will be openly published to enable reuse, refinement, and extension. |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | Yes, the data will include qualified references to other data sources, including data from the project itself and datasets from previous research, to ensure comprehensive context and enhance data quality. |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | The exact licensing will be determined by the business and exploitation strategy of the FLEXBY project. |
| **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?** | N/A |

| | |
|---|---|
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | N/A |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | N/A |

## GD-FLEXBY-Dataset #4

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, the datasets will be assigned a unique UUID. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | LCA metadata, including process descriptions, dataset authors, locations, and modelling options, will be structured according to ISO 14040-14044 standards, as well as the UNEP SETAC Guidelines for social LCA. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | No |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | Yes, metadata will be provided in a manner that facilitates harvesting and indexing. |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Data accessibility will be subject to consortium decisions regarding confidentiality and/or commercial sensitivity. It will be deposited in dedicated repositories designated by the consortium as part of the project's development activities. |
| **Will all data and/or metadata be made openly available?** | N/A |
| **How long will the data and/or metadata remain available and findable?** | This is not decided yet. No plans to remove published data so far. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes, documentation on accessibility will be made available. |
| **INTEROPERABILITY** | |
| **What data and metadata vocabularies, standards, formats or methodologies will** | Data will adhere to accepted LCA methodologies and metadata |

| | |
|---|---|
| **you follow to make your data interoperable to allow data exchange and re-use within and across disciplines?** | standards. Endorsed practices by entities such as SETAC will be followed, ensuring that the data is interoperable and facilitates data exchange and re-use within and across disciplines. |
| **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?** | Mappings to commonly used LCA nomenclatures will be provided if project-specific ontologies or vocabularies are generated. An ontology is not planned to be provided. Any generated ontologies or vocabularies will be openly published to enable reuse, refinement, and extension. |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | Yes, the data will include qualified references to other data sources, including data from the project itself and datasets from previous research, to ensure comprehensive context and enhance data quality. |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | The exact licensing will be determined by the business and exploitation strategy of the FLEXBY project. |
| **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?** | N/A |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | N/A |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | N/A |

## 3.6. A4F

### A4F-FLEXBY-Dataset #1

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, data will be identified by a persistent identifier assigned by Zenodo repository |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, it will be included in the ZENODO repository |
| **Will all data and/or metadata be made openly available?** | No |
| **How long will the data and/or metadata remain available and findable?** | No limit |
| **Will documentation or reference about any software be needed to access or read the data be included?** | No |
| **INTEROPERABILITY** | |
| **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?** | Data will be provided in more than one common digital formats for photographs (e.g., JPEG, PNG) |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | N/A |
| **RE-USABILITY** | |

| | |
|---|---|
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided. |
| **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?** | No |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | No |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary |

## A4F-FLEXBY-Dataset #2

| **FINDABLE** | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, data will be identified by a persistent identifier assigned by Zenodo repository |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, it will be included in the ZENODO repository. |
| **Will all data and/or metadata be made openly available?** | No, the data will be a key component of the commercial exploitation of the results |
| **How long will the data and/or metadata remain available and findable?** | No limit |
| **Will documentation or reference about any software be needed to access or read the data be included?** | No |
| **INTEROPERABILITY** | |
| **What data and metadata vocabularies, standards, formats or methodologies will you follow to make your data interoperable to allow** | Data will be in common .xlsx and .csv formats to allow data exchange |

| | |
|---|---|
| **data exchange and re-use within and across disciplines?** | |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | N/A |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided. |
| **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?** | No |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | No |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary |

## 3.7. US

**US-FLEXBY-Dataset #1, #2 & #3**

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, and the public dataset will be included in the ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, it will be included in the ZENODO platform. |
| **Will all data and/or metadata be made openly available?** | This will be agreed within the consortium and IP issues will be addressed. |
| **How long will the data and/or metadata remain available and findable?** | No limit |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

| | |
|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | Readme files with suitable information will be provided. |
| **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?** | The data agreed upon with the partners will be made freely available in the public domain to permit re-use. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, if necessary. |

## 3.8. GALP

### GALP-FLEXBY-Dataset #1

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | TBD |
| **What metadata will be created? What disciplinary or general standards will be followed?** | N/A |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, a DOI will be assigned when uploading the dataset file on Zenodo. |
| **Will all data and/or metadata be made openly available?** | N/A |
| **How long will the data and/or metadata remain available and findable?** | N/A |
| **Will documentation or reference about any software be needed to access or read the data be included?** | No |
| **INTEROPERABILITY** | |
| **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?** | The dataset will follow SI standards. |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | This can happen, since the data in the dataset will be about the produced fuels by partners. |

| RE-USABILITY | |
|---|---|
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | The dataset is comprised of composition analysis, no *readme* file is anticipated. |
| **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?** | The dataset will be licensed under CCBY on Zenodo. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes, the characterization and analysis results obtained will be usable by third parties. |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes, laboratorial standards will be followed. |

## 3.9. PMI

### PMI-FLEXBY-Dataset #1

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, and the public dataset will be included in the ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, the dataset will be deposited on Zenodo. |
| **Will all data and/or metadata be made openly available?** | Yes, the dataset will be published on Zenodo repository under CCBY license. |
| **How long will the data and/or metadata remain available and findable?** | The data will be retained in Zenodo for the lifetime of the repository. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | Yes, the dataset will include references to related datasets from previous phases of the project and relevant datasets in public |

| | |
|---|---|
| | repositories that have been used to interpret the data. |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | A readme.txt file will be attached to the dataset. |
| **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?** | The dataset will be licensed under CCBY on Zenodo. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes |

## PMI-FLEXBY-Dataset #2

| **FINDABLE** | |
|---|---|
| **Will data be identified by a persistent identifier?** | Yes, and the public dataset will be included in the ZENODO platform. |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata is envisaged for this dataset. |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | Yes, the dataset will be deposited on Zenodo. |
| **Will all data and/or metadata be made openly available?** | Yes, the dataset will be published on Zenodo repository under CCBY license. |
| **How long will the data and/or metadata remain available and findable?** | The data will be retained in Zenodo for the lifetime of the repository. |
| **Will documentation or reference about any software be needed to access or read the data be included?** | Yes |

| INTEROPERABILITY | |
|---|---|
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your project, or datasets from previous research)?** | Yes, the dataset will include references to related datasets from previous phases of the project and relevant datasets in public repositories that have been used to interpret the data. |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | A readme.txt file will be attached to the dataset. |
| **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?** | The dataset will be licensed under CCBY on Zenodo. |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | Yes |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | Yes |

## 3.10. CVE

### CVE-FLEXBY-Dataset #1

| FINDABLE | |
|---|---|
| **Will data be identified by a persistent identifier?** | No |
| **What metadata will be created? What disciplinary or general standards will be followed?** | No metadata envisaged |
| **Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?** | N/A |
| **Will metadata be offered in such a way that it can be harvested and indexed?** | N/A |
| **ACCESIBLE** | |
| **Will the data be deposited in a trusted repository?** | No |
| **Will all data and/or metadata be made openly available?** | No |
| **How long will the data and/or metadata remain available and findable?** | Until after the material from the workshop has been shared to the participants |
| **Will documentation or reference about any software be needed to access or read the data be included?** | No |
| **INTEROPERABILITY** | |
| **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?** | N/A |
| **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?** | N/A |
| **Will your data include qualified references to other data (e.g. other data from your** | N/A |

| | |
|---|---|
| **project, or datasets from previous research)?** | |
| **RE-USABILITY** | |
| **How will you provide documentation needed to validate data analysis and facilitate data re-use?** | N/A |
| **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?** | No |
| **Will the data produced in the project be useable by third parties, in particular after the end of the project?** | No |
| **Will the provenance of the data be thoroughly documented using the appropriate standards?** | N/A |

# 4. OPEN-SOURCE APPROACH CONSIDERATIONS

An open-source approach refers to the use of open-source software tools and methodologies in a particular area, such as data management planning. Open-source software is released under an open-source license, which allows anyone to view, modify, and distribute the source code. This approach to software development encourages collaboration, transparency, and flexibility. This approach offers several advantages, including:

- ✓ Cost-effectiveness: Open-source software is often free, or available at a much lower cost than proprietary software, making it an affordable option for researchers and institutions.
- ✓ Flexibility: Open-source software is highly customizable, allowing researchers to tailor it to their specific needs and workflows.
- ✓ Transparency: Open-source software is transparent, meaning that users can review and modify the source code, ensuring that the software is trustworthy and reliable.
- ✓ Collaboration: Open-source software encourages collaboration and knowledge-sharing among researchers, making it easier to work together on research projects and to share data.

In the context of data management planning, an open-source approach involves using open-source software tools and platforms to create, manage, and share research data,. Those platforms provide a range of features, such as data storage, data sharing, and version control, which can help researchers to organize and manage their data more efficiently.

In addition to using open-source software tools, an open-source approach for DMP also involves adhering to open standards and best practices. Such as FAIR principles which provide a framework for making research data more open and accessible. By following these principles, researchers can make their data more easily discoverable, reusable, and shareable.

Overall, an open-source approach to data management planning can help researchers to create more efficient and effective data management plans while fostering collaboration and knowledge-sharing within the research community.

## 4.1. OPEN ACCESS REPOSITORY

The FLEXBY consortium will make use of the free-of-charge **Zenodo repository** to make data accessible. As already explained in *D1.1– Project Management Plan* (M2), Zenodo is a general-purpose open repository run by CERN that was created through the European OpenAIRE program. It enables the deposit of research papers, datasets, software, reports, and other digital artifacts relevant to the study. A persistent digital object identification (DOI) is created for each submission, making the saved materials easily citable and accessible. For the FLEXBY project, a specific FLEXBY community will be created in Zenodo.

Using the Zenodo repository, an OpenAIRE-compliant repository, the consortium will provide instant open access to all peer-reviewed scientific articles produced in the project (at the latest, at the time of publication) as well as all public datasets. To achieve the most significant impact among scholars, policymakers, and enterprises, the material deposited in Zenodo will be immediately indexed in OpenAIRE. When appropriate, each consortium partner will additionally make available through the repository any research outputs, instruments, or tools required to verify the findings of the paper.

The deposited publications will include the required metadata according Annex 5 of the GA. In order to maximize the impact of the project results, publication in fully open-access journals will be encouraged. However, some hybrid journals with a high impact in their field may also be taken into consideration (in this case, the money for the APC fees will come from other sources). Consideration will also be given to the publication in Open Research Europe. The associated costs will be claimed as part of the Horizon Europe grant.

IDE as coordinator, will hold the responsibility of maintaining the DMP with the contribution of the other consortium members and, will promote and monitor compliance with the CE obligations and recommended best practices regarding FAIR data management. At this point, the person responsible for the data management in the FLEXBY project is Nuria Ferrera Lorenzo from IDE (e-mail: nuria.ferrera@idener.ai).

# 5. DATA SECURITY

Each consortium member is responsible for ensuring the security and proper storage of their datasets. To ensure reliable backup operations, some datasets might be handwritten and later converted into digital records. Additionally, experienced IT system administrators from each organization will securely manage and store the digital assets and resources developed or used during the project. The consortium partner responsible for the repository (such as a Hosted Cloud Service) will handle the security of data stored in public or shared repositories. This partner will ensure that the data is encrypted during transport and that access control is finely tuned based on the user's role within the FLEXBY project.

# 6. ETHICAL ASPECTS

In the FLEXBY project, no ethical or legal issues have been identified that could impact data sharing. According to the 'Ethics Summary Report,' both the proposal and the project have been assessed as 'ethics ready.' This indicates that all necessary ethical considerations have been addressed from the outset.

Within WP1 – Project Management, there is a dedicated task for handling ethics requirements, specifically **Task 1.3 – Risk and Ethics Issues Management**. This task has been incorporated to proactively manage any potential ethical risks and ensure the project adheres to all relevant ethical standards. The outcomes of this task will be detailed in deliverable **D1.4 – Ethics Requirement and Facility Authorisation Reports**. This deliverable will focus on identifying and resolving any administrative issues related to facility authorizations and health and safety procedures that might arise during the project.

Furthermore, this task will ensure compliance with ***GDPR*** by including the beneficiary's confirmation regarding data protection regulations. This includes detailing the systems and privacy practices in place and implementing privacy-by-design and privacy-by-default principles to safeguard personal data throughout the project's lifecycle. By embedding these comprehensive measures, the FLEXBY project aims to maintain high ethical standards and ensure the secure and responsible handling of all project data.

# 7. OTHER ISSUES

The FLEXBY project does not make use of other national/funder/sectorial/departmental procedures for data management, and no other direct issues have been found in the data management plan.