



Data Management Plan

Valentina Colla

January 31st, 2025



Project co-funded by the Research Fund for Coal and Steel (RFCS)

G.A. 101156509

The information and views set out in this document do not necessarily reflect the official opinion of the European Commission. The European Commission does not guarantee the accuracy of the data included in this document. Neither the European Commission nor any person acting on the European Commission's behalf may be held responsible for the use which may be made of the information contained therein.

Table of contents

Document history	4
1.Introduction	5
1.1 Scope	5
1.2 Definitions.....	5
2.Data Management Strategy	6
2.1 Data types and potential users	6
2.2 Data management steps.....	8
2.3 Roles and Responsibilities	11
2.4 Data Archiving, Sharing, Publishing and Preserving Infrastructure.....	12
3. FAIR Data Principles	14
3.1 Findability	14
3.2 Accessibility.....	16
3.3 Interoperability	19
3.4 Reusability	19
4. Data Summary	22
5. Allocation of resources	27
6. Data Security	28
7. Other research outputs.....	29
List of Figures	30
List of Tables	30
List of Acronyms and Abbreviations	31

Project Acronym Symbio-Steel

Project Title	Fostering Industrial Symbiosis solutions for the steel sector by results monitoring and dissemination from national and EU funded projects coupled to definition of cross-sectorial synergy scenarios.
Number	101156509
Start date	01/10/2024
End date	30/09/2026

Deliverable No. 1.3 Quality Control Plan

Dissemination level	PU
Work Package	WP 1. Project management and coordination
Task	T 1.1. Quality control and risk management
Lead beneficiary	SSSA
Contributing beneficiaries	SWERIM, K1-MET, RINA-CSM, FEHS
Due date of deliverable	31/01/2025 (M4)

Document history

No.	Date	Beneficiary	Contributor
1.	24/01/2025	SSSA	Valentina Colla
2.	27/01/2025	K1-MET	Lina Kieush
3.	27/01/2025	RINA-CSM	Claudia Sergi
4.	29/01/2025	SWERIM	Han Yu
5.	30/01/2025	SSSA	Valentina Colla
6.	31/01/2025	SWERIM	Chuan Wang
7.	31/01/2025	SSSA	Valentina Colla

1. Introduction

1.1 Scope

In Symbio-Steel, various types of data and information will be collected, handled, analysed, used, processed and generated. Therefore, the present document (Deliverable 1.1) aims to provide information and guidance on the correct management of data related to the Symbio-Steel project. The Data Management Plan (DMP) will follow the European Commission (EC) guidelines to list the main datasets to be shared and the information necessary to implement the FAIR principles (Findable, Accessible, Interoperable, Reusable). The data management plan will be updated again during the project by revising the information about the datasets to share and the implementation guidelines.

The DMP can be considered as the “data sheet and manuals” which allows knowing data to be handled, their features and the rules for their interpretation and usage, including their verification and reuse during and after the project. For the Symbio-Steel-related data, a description is provided including their typology and source, the (meta)data used for their explanation, preservation, and maintenance, the policies for their storage, access, sharing, protection, exploitation, as well as to make them accessible for their reuse, in accordance with EC’s FAIR Data Management principles and guidelines.

1.2 Definitions

The terms frequently found in this document are defined according to Oxford Languages, as follows:

- Dataset - A collection of related sets of information that is composed of separate elements but can be manipulated as a unit.
- Metadata - A set of data that describes and gives information about other data.
- Repository – A central location in which data is stored and managed.
- Confidential - Intended to be kept secret.
- Open-Access - The unrestricted right or opportunity to use or benefit from something, particularly academic writing or research.

2.Data Management Strategy

This chapter provides information on the type of data that will be collected, exploited, and generated during Symbio-Steel and the steps related to classifying them. In addition, roles and responsibilities are defined.

2.1 Data types and potential users

During the project, different data types will be managed and their classification depends on their features and origin.

The project expects to generate different datasets, for example, from the developed analyses of research outputs or from interviews and surveys. This will require support for several formats, e.g., DOC, PDF, XLS, CSV, EMBL, etc.. Sizes will vary from a few MBs to GBs.

In particular, the data types reported in Table 1 are expected to be circulated and managed during Symbio-Steel.

Table 1. Data types

ID	Type	Description
ANA	Analysis	Data including both numbers and text coming from Symbio-Steel-based analyses.
EXP	Experimental	Data in the forms of numbers collecting input and output results of all the experimental trials carried out before Symbio-Steel by its partners and contacted stakeholders, and focusing on Symbio-Steel topics
IMG	Image	Data in the form of an image
IND	Industrial	Data in the forms of numbers and time series coming from industrial historical databases and/or analyses done by contacted industrial stakeholders before Symbio-Steel
PRO	Protocol	Data and information, including the procedure to be followed for a particular purpose
REF	Reference	Data coming from literature or from other external sources, e.g. market, regulations, used as reference

SIM	Simulation	Data in the forms of numbers characterizing results of simulated scenarios before Symbio-Steel by its partners and contacted stakeholders, and focusing on Symbio-Steel topics
SUR	Survey	Data derived from specific surveys or interviews
TXT	Text	Text database or unstructured data in the form of text

According to accessibility, the data can be further divided in two categories, as reported in Table 2.

Table 2. Accessibility data classification

ID	Type	Description
CO	Confidential	Data which cannot be publicly shared for internal regulations, legal and/or competition reasons, business, industrial and/or trade secrets that data providers, e.g., contacted stakeholders, must comply with.
PU	Public	All the data that will be fully published according to Open Science principles.

Data types and final users can be different. Some potential users are:

- Symbio-Steel consortium .
- Social and Environmental scientists.
- Industrial Symbiosis experts.
- Steelmaking and process industry.
- Energy intensive industries.
- Students.
- Workers/Workforce.
- Scientific Communities.
- Policy Makers.

Symbio-Steel partners will have access to all or part of the confidential data while the other listed users will be able to consult only public data.

All the tables and lists included in this subsection will be updated if new data types or users will emerge during the project evolution.



2.2 Data management steps

Different data types will be collected, used and generated during the project. Accordingly, a stepwise approach has been defined developing a series of questions to cluster the data correctly and, consequently, manage them. The two flowcharts shown in Figures 1 and 2 summarize the questions allowing the definition of the different data types and whether if they are considered confidential or not, respectively.

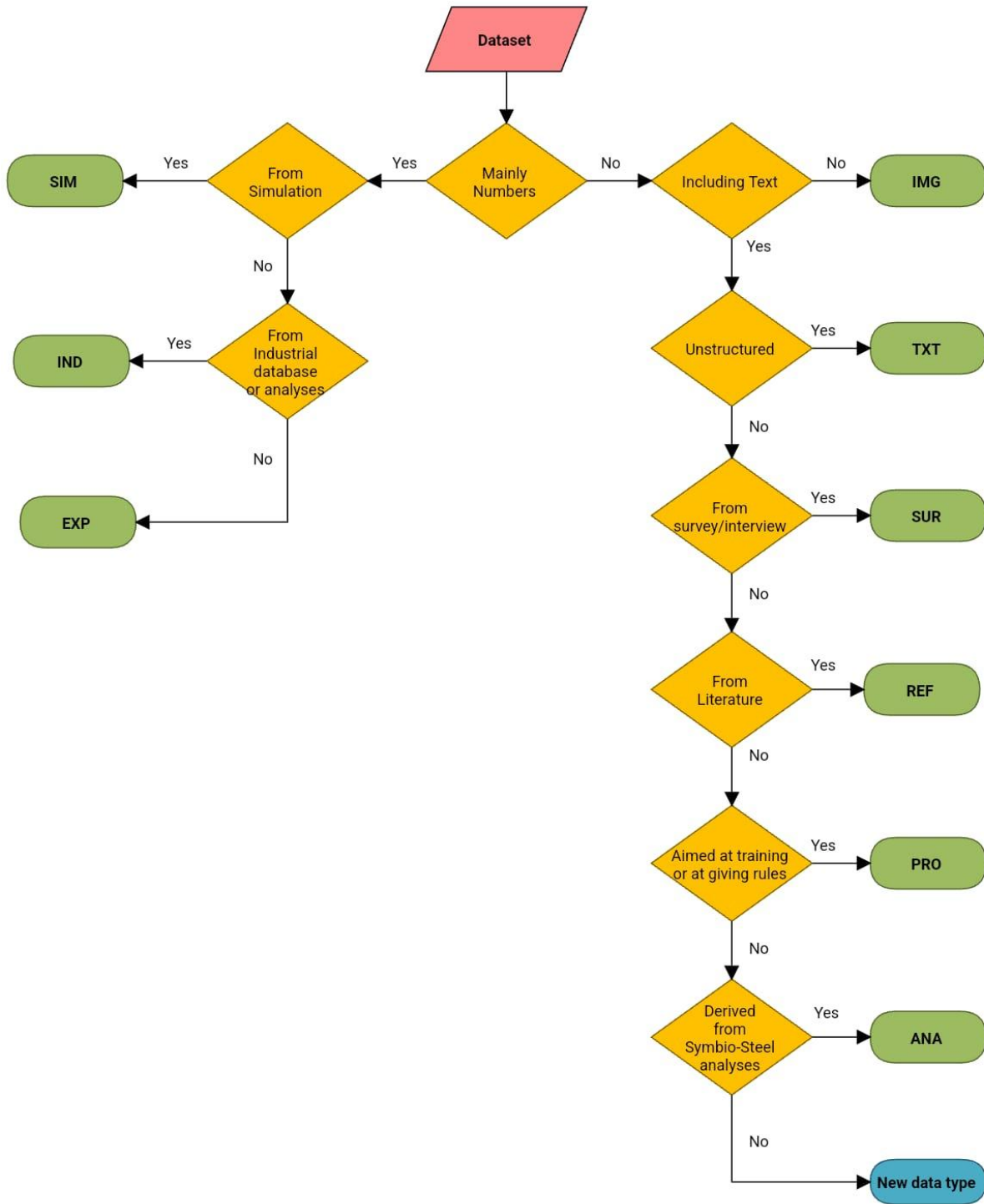


Figure 1. Data type definition flowchart.

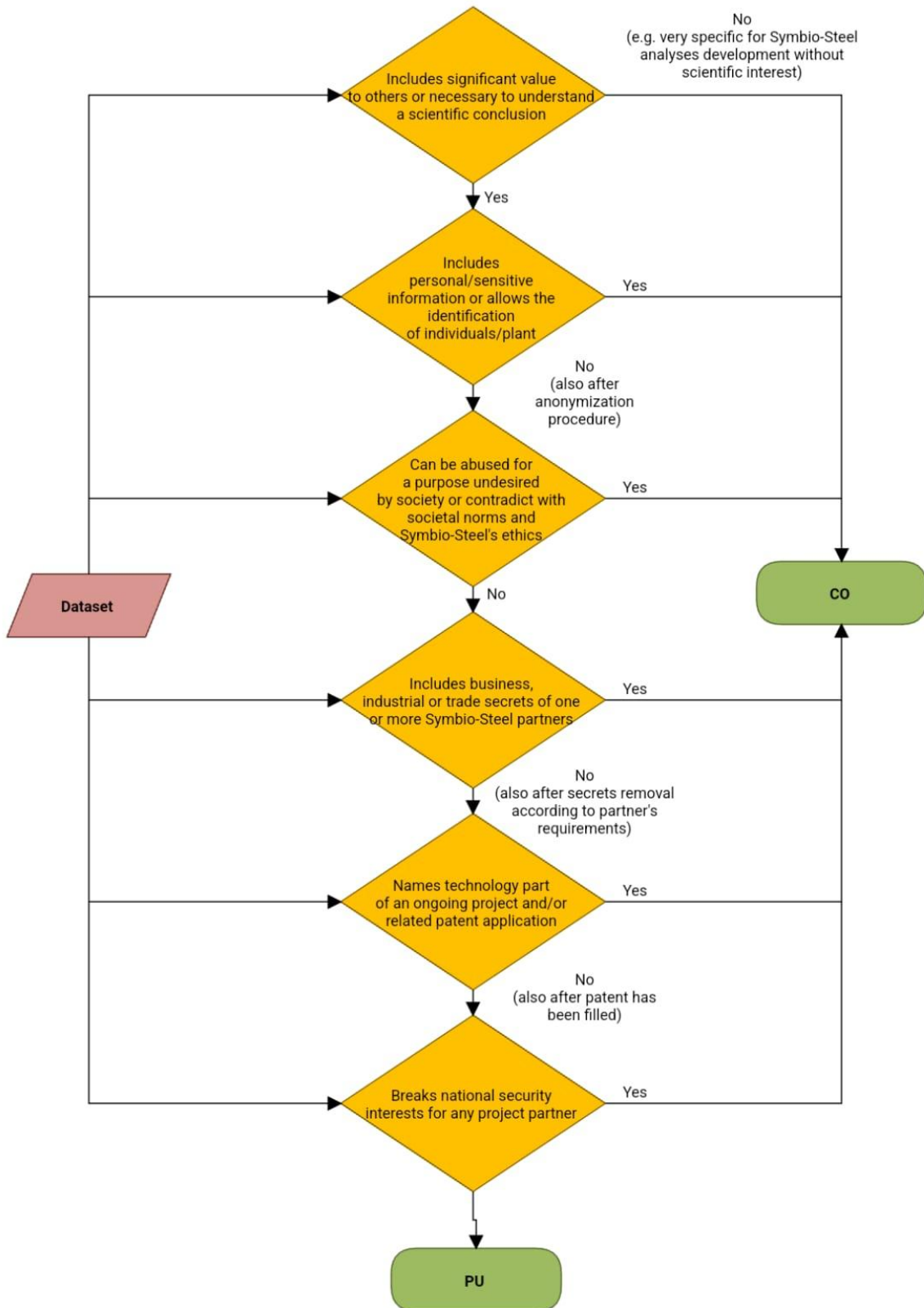


Figure 2. Data accessibility definition flowchart.

2.3 Roles and Responsibilities

The right application of this DMP can be possible only through a structured division of roles and responsibilities. Table 3 reports all the designated and involved figures (also supporting ones).

Table 3. Roles and responsibilities for DMP application and support

ID	Role	Responsibilities	Designated partner(s)
PDC	Project data contact (DMP leader)	<p>Reserve DM dedicated time slot at project plenary meetings and prepare and lead related discussions (only if needed).</p> <p>Inform EC about the work done, outcomes, publications and related published data or of the reasons for the definition of a specific dataset as confidential.</p> <p>Host and maintain the OneDrive platform as internal Symbio-Steel sharepoint and repository.</p> <p>Provide a service to be contacted for further questions and work related to DM also after the Symbio-Steel end.</p>	SSSA
DMP_CR	DMP Coordinator	<p>Develop and implement DMP.</p> <p>Supervise DMP application.</p> <p>Communicate DMP to all the partners.</p> <p>Make periodical checks to be sure that data are correctly uploaded to the repository.</p> <p>Ensure data availability.</p>	SSSA
DMP_CM	DMP Committee	<p>Guide partners involved in a specific WP for the application of DMP.</p> <p>Control data quality and consistency.</p> <p>Evaluate and approve data considered suitable to be published.</p> <p>Monitor overall data flow</p>	WP Leaders, i.e., SSSA, Swerim, FeHS, RINA-CSM, K1-MET
DMP_U	DMP Users	Respect DMP.	All partners

		<p>Collect, manage, generate, validate, update and store datasets and metadata.</p> <p>Identify confidential data or project results suitable for publication.</p> <p>Upload data suitable for publication after eventual modifications required by DMP_CR.</p> <p>Make back-up and preserve data Consulting all the other partners involved in specific data generation</p>	
Q&RM	Quality and Risk Manager	Assure data quality	SSSA

2.4 Data Archiving, Sharing, Publishing and Preserving Infrastructure

Within Symbio-Steel, data storing, sharing, publishing and preserving will be managed through an internal SharePoint and web-based platforms, ensuring long-term access to all circulated and generated data and results.

Brief descriptions of the main exploited platforms are provided below:

- **Symbio-Steel website** – It provides information on the overall approach, expected goals and the consortium. A specific section is dedicated to results and all open-access materials and there the guest can download related files or will be transferred to open-access repositories or the publisher’s website such as in the case of articles. The list of the events and a blog section are also included.
- **OneDrive** - it constitutes the internal SharePoint for Symbio-Steel data and results. OneDrive is a file hosting service operated by Microsoft allowing registered users to share and synchronize their files. PDC hosts and maintains the Symbio-Steel OneDrive folder, and access is ensured to all the consortium partners who can upload, update, and read data and files.
- **Zenodo** – it is an open-access repository that was developed for the OpenAIRE project, and it is maintained by CERN (Conseil européen pour la Recherche Nucléaire' or European Council for Nuclear Research). It allows researchers to store and share their results in different formats and for all scientific disciplines. It supports both publication of scientific, white papers and structured research data. The uploaded results/data are structured using metadata that is licensed under a CC license. The

property rights and/or the ownership of a result is not affected by uploading it in Zenodo.

3. FAIR Data Principles

This DMP follows principles and guidelines provided by the EC FAIR Data Management principles and guidelines. In particular, it complies with the “The FAIR Guiding Principles for scientific data management and stewardship” by Wilkinson et. al.¹. FAIR principles comprise Findability, Accessibility, Interoperability and Reusability of data and “*put specific emphasis on enhancing the ability of machines to automatically find and use the data, in addition to supporting its reuse by individuals*”. These principles are linked one to the other and the right following of one of them gives advantages in achieving the others.

Considering the Symbio-Steel-related data, FAIR data principles apply completely to datasets suitable and available for public use, but they are applied also in case of datasets considered confidential or sensible by implementing specific adaptations and rules.

Details on the data management policy following FAIR data principles are provided in the following subsections.

3.1 Findability

Symbio-Steel plans to use storage from consortium infrastructures and public repositories to store data, i.e., Zenodo, keeping them published in a catalogue which uses standard metadata formats. This will enable the possibility to generate Digital Object Identifiers (DOIs) for the datasets.

Data management aims at making data finding as easy as possible for both humans and computers, consortium partners and external users because if data cannot be found, they cannot be used. In this context, Wilkinson et al.¹ suggest:

- (Meta)Data are assigned a globally unique and persistent identifier
- Data are described with rich metadata (see subsection 3.4)
- Metadata clearly and explicitly includes the identifier of the data it describes

¹ Wilkinson, M. D., Dumontier, M., Aalbersberg, I. J., Appleton, G., Axton, M., Baak, A., Blomberg, N., Boiten, J.W., Bonino da Silva Santos, L., Bourne, P. E., Bouwman, J., Brookes, A. J., Clark, T., Crosas, M., Dillo, I., Dumon, O., Edmunds, S., Evelo, C. T., Finkers, R., Gonzalez-Beltran, A., Gray, A. J. G., Growth, P., Grethe, J. S., Mons, B. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific data*, 3(1), 1-9.

- (Meta)Data are registered or indexed in a searchable resource.

This DMP ensures the findability of all the Symbio-Steel-related data not only within the consortium but also outside the consortium for open access data and research outputs.

The starting point is a standardized data file naming convention including the following information:

1. Acronym of the project – [Symbio-Steel].
 2. Number of the related work package – [WPx]
 3. Name of data - [DatasetName]
 4. Accessibility of data – [ACC]
 5. Date - [YYMMDD]
6. Version number that will be incremental at each revision [Vm.p]

The result is the following:

Symbio-Steel_WPx_DatasetName_ACC_YYMMDD_Vm.p

This data file naming convention makes the files unique and retraceable even if data will not get a Digital Object Identifier (DOI), e.g., sensible or internal data shared between partners.

Indeed, depending on the data type, storage will be ensured both in partners infrastructure/internal consortium archives as well as in public repositories. Only in the latter case, data will be saved with DOI allowing the facilitation of their identification and achieving effective and persistent citation. On the other side, for internally stored data, the data file name will act as an “internal persistent identifier”.

Each dataset’s DOI should be used for all the related publications to easily identify the linked datasets. Furthermore, data will be kept published in a data catalogue, e.g., CKAN, that uses standard metadata formats

The metadata describing the Symbio-Steel data will include the information provided in subsection 3.4.

Search keywords common to the Symbio-Steel application field and describing the dataset or content of the data will also be included in the metadata and will be provided when a dataset is uploaded to a repository aiming at optimising possibilities of finding and re-use (see subsection 3.4)

Finally, cross-referencing between different data must be ensured each time a partner generates new data.

3.2 Accessibility

According to Wilkinson et al.¹ the definition of accessibility entails:

- (Meta)Data are retrievable by their identifier using a standardized communications protocol
- The protocol is open, free, and universally implementable
- The protocol allows for an authentication and authorization procedure, where necessary
- Metadata are accessible, even when the data are no longer available

Therefore, accessibility directly follows data findability and is fundamental to increase the impact of data and projects results. Accessibility can be achieved through authentication and authorization. The first consists of proving the identity of a user, while authorization concerns the check of the specific access rights or privileges of the authenticated user because not all users have the possibility to consult a certain data.

All the data obtained from public repositories will be offered in the same way and as soon as they are available. In the case of data provided by partners and generated during the project, Symbio-Steel will make it public indicating the owner and license with the exception of all those cases in which they must be kept confidential due to IPR protection issues or in case of personal data (GDPR and other regulations must be fulfilled). Access to such data will be provided when associated publications are published or earlier, if possible.

The access to the data (including results) and the related sharing will be maximized during Symbio-Steel within and outside the consortium. Although the policy “as open as possible” will be followed and CC-BY-SA licenses will be promoted (see subsection 3.4), some of the data will be considered confidential (see Figure 2).

All the data obtained from public repositories will be offered in the same way as soon as it is available. While in the case of data provided by partners and/or generated during the project, an evaluation will be done, and the confidentiality of a data, as well as the open access policy, will be defined following the rules outlined in the Grant Agreement in Article 13, 15 and 17. Further specific rules/steps to decide if data can be considered public or confidential are provided in subsection 2.1 of this document.

Access to data deemed suitable for public release will be provided through:

- Publications in scientific journals ensure the possibilities of applying Gold Open Access.
- Presentation at conferences.

- The project website.
- Social Networks, i.e., LinkedIn.
- European commercial social networking site for scientists and researchers, e.g., ResearchGate.
- Zenodo repository or any other repository complying with the FAIR Data Principles for open access research data, e.g., EOSC, OpenAIRE, re3data.org, EUDAT, DataHub.

In case of data considered suitable for open access or of data used for developing a paper, not subject to protection/embargo, and in case their release does not jeopardize the project's main objective, the procedure depicted in the flowchart reported in Figure 3 will be carried out to facilitate their upload in open-access online platforms. During the process, the DMP Committee will consider IPR rules as defined in Article 16 of the Grant Agreement to avoid any issues and conflicts.

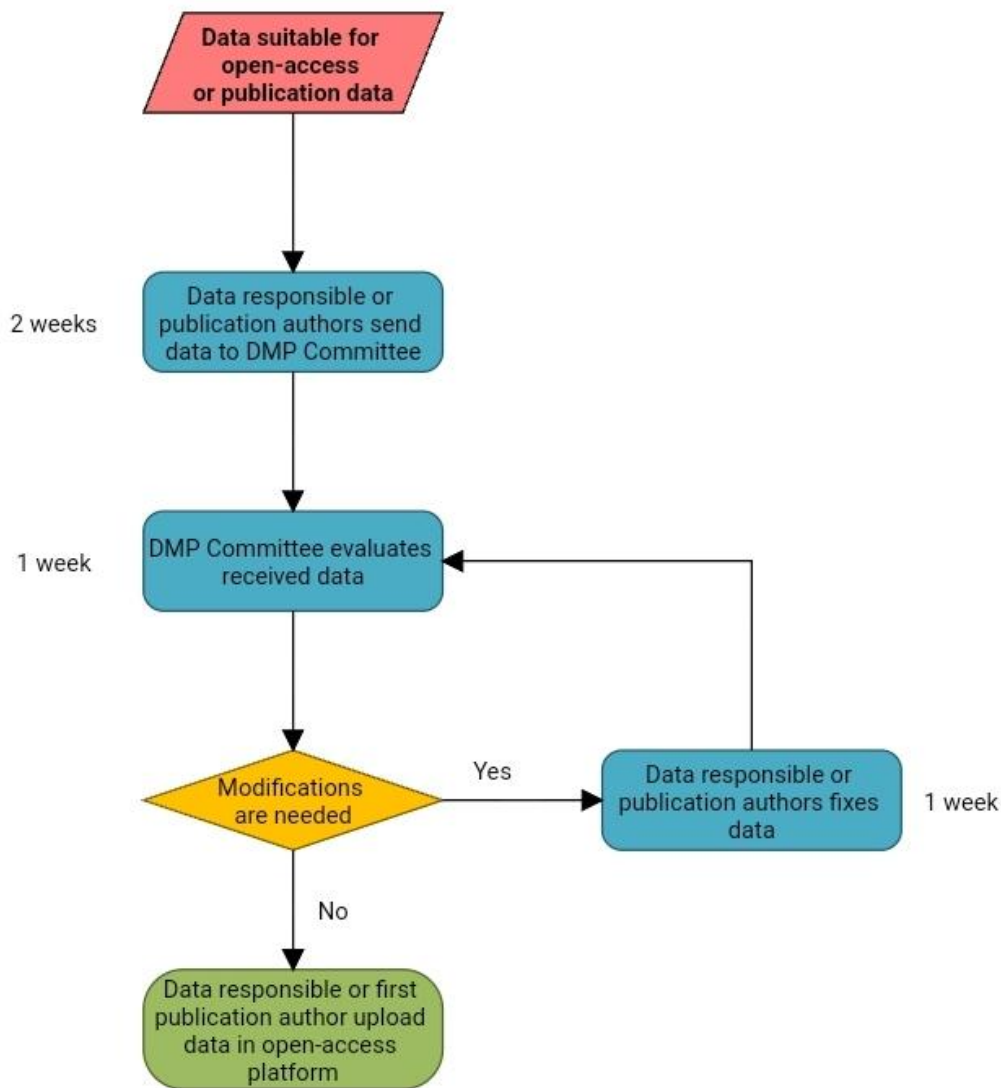


Figure 3. Open-access data uploading steps.

On the other hand, when a datum is confidential, a justification must be provided by the data responsible, considering the rules previously cited (see Figure 2). If further reasons emerge, this DMP will be updated. Confidential data can be subject to anonymization, aggregation, minimization, normalization, or sampling procedures that can make them free from sensitive information and thus suitable for publication.

Confidential data access will be ensured in the consortium through:

- OneDrive if the authorization is provided to all the Symbio-Steel consortium.

- Internal partner infrastructure/repositories if the authorization is only for some partners of the consortium.

In the case of data surely to be protected, the involved partner should notify the project coordinator, all the consortium beneficiaries and the DMP Committee as soon as possible to ensure the optimum level of confidentiality and the use of this data without issues already from an early stage of the project.

3.3 Interoperability

Wilkinson et al.¹ when defining the concept of interoperability considers the following points:

- (Meta)Data use a formal, accessible, shared, and broadly applicable language for knowledge representation
- (Meta)Data use vocabularies that follow FAIR principles
- (Meta)Data include qualified references to other (meta)data

In general, interoperability means facilitating data integration between them.

Accordingly, to increase the interoperability of data during the Symbio-Steel project, some rules will be followed:

- Datasets will be published in standard forms, e.g., XLS/XLSX, CSV, EMBL, TXT, PDF, DOC/DOCX, TIFF, JPEG, PNG, JPG, etc.
- Whenever possible SI Units will be used in datasets.
- Commonly used vocabularies will be used for the metadata.
- Reference to other (meta)data are always provided.
- Same wording and acronyms consistent to standard of publications will be used.
- OpenAIRE guidelines for online interoperability will be followed².

3.4 Reusability

According to Wilkinson et al.¹ the following definition of the last FAIR principle is provided:

- (Meta)Data are richly described with a plurality of accurate and relevant attributes.
- (Meta)Data are released with a clear and accessible data usage license.

² OpenAIRE Guideline, accessible at <https://guidelines.openaire.eu/en/latest/>

- (Meta)Data are associated with detailed provenance.
- (Meta)Data meet domain-relevant community standards.

Data collected from other sources will be provided as available originally. For those datasets provided by the project, licenses like CC BY-SA will be promoted, since they allow for reuse and adaptation, while they still require attributing the author and do not allow for change of the original license. Reusability is related to optimizing the reuse of collected and generated datasets. To this aim, efforts will be made to describe in a clear and exhaustive way all the (meta)data. A general overview of attributes that will be included in Symbio-Steel metadata is provided in Table 4.

Whenever possible, the following policy will be followed:

- Data collected from other sources will be provided as available originally.
- For those datasets provided by the project and evaluated as suitable for public use, licenses like CC BY-SA will be promoted. These kinds of license allow reusing and adaptation, while still requiring attributing the author, furthermore changing the original license is not allowed.
- Further license will be evaluated on a case-by-case basis.

As for accessibility (see subsection 3.2), reusability will also be facilitated by the uploading of suitable datasets to Zenodo or similar repositories. Furthermore, open-accessible datasets will be made available to third parties after they are generated, and access will be ensured for at least one year (renewable) after the completion of the project to improve the reusability. Possible restrictions, e.g., embargo or restrictions from editors or conference organizers, need to be respected before the sharing of datasets and will be evaluated on a case-by-case basis.

Who generates the data and the PDC is responsible for maintaining the data after the end of the project and guiding their reuse.

Table 4. Metadata attributes

Attribute	Description
Persistent identifier, e.g., DOI if applicable	Dataset long-lasting reference
Internal standard name	Standardized data file name (see subsection 3.1)
Creator/Responsible Partner	Who created/firstly shared the dataset
Type of data	Type of the data
Description	Brief dataset description
Aim	How data are used

Work Package/Task /Deliverable	Associated work package, task and/or deliverable
Origin	The data source or how data have been generated
Processing	How data have been processed
Repository	Where data will be uploaded
Language	Languages used in the dataset
Acronym List	Explanation of used abbreviations
Format	Data formats
Software	Software needed to create, use, analyse, read data
Expected size	Estimate of dataset size
Keywords / Tags	Keywords describing the data content
Version	Dataset Version
Date of first Repository Submission	Release date (YY MM DD)
Date of last modification	Last modification date (YY MM DD)
Access Information	Confidential or Public
Accessibility	Rights information on the data use

Quality Assurance Procedures are defined and will be followed to ensure the suitable quality of the data generated throughout the project. These procedures will be described in related Deliverable D1.3 – Quality control plan.

4. Data Summary

Table 5 provides a list of data expected to be collected, analysed, used and generated within Symbio-Steel. It provides the type, the potential user, and the accessibility of data together with a series of information concerning the scope of the data, its origin, and the responsible partner. In addition, the information provided in the table for each data includes the possible format(s) and an estimation of the number of stored values and its storage size.

Probably the list provided is not exhaustive. Therefore, it will be updated within the project duration.

Table 5. List of expected Symbio-Steel data.

Name	Type	Aim	Origin	Responsible Partner(s)	Potential User(s)	Potential Format	Estimate Size	Accessibility
Industrial Symbiosis related literature Data	REF, IMG	Provide reference data for all the different activities to be developed in Symbio-Steel	Literature	The partners who found it	Symbio-Steel Consortium	PDF, XLS/XLSX, JPG, PNG	Up to 200 files, Up to 1 GB	PU
Industrial Symbiosis related regulatory Data	REF	Provide regulatory data for all the different activities to be developed in Symbio-Steel	Regulations, Stakeholders	FEhS or the partners who found it	Symbio-Steel Consortium	PDF, DOC/DOCX	Up to 50 files, Up to 250 MB	PU
Industrial Symbiosis related projects Data	REF, IMG, IND, EXP, SIM, TXT	Provide reference data, including industrial, experimental and simulation data and coming from projects focusing on industrial symbiosis to be used for all the different activities to be developed in Symbio-Steel	Literature, Project Websites, Project Partners	The partners who found it	Symbio-Steel Consortium	PDF, XLS/XLSX, DOC/DOCX, CSV, JPG, PNG, TXT	Up to 50 files, Up to 2 GB	PU, CON (depending on data)

<p>Key-Performance Indicator Data</p>	<p>PRO, ANA</p>	<p>Provide the list of defined Key-Performance Indicators and related computed values</p>	<p>Symbio-Steel Tasks and Stakeholders</p>	<p>K1-MET and/or the partners who collect the results</p>	<p>Symbio-Steel Consortium, Industrial Symbiosis experts, Steelmaking and process industry, Energy intensive industries, Scientific Communities</p>	<p>PDF, XLS/XLSX, DOC/DOCX</p>	<p>Up to 50 files, Up to 500 MB</p>	<p>PU, CON (depending on data)</p>
<p>Technology list for steel-driven industrial symbiosis</p>	<p>REF, IMG, ANA</p>	<p>Provide an extensive list of technologies concerning industrial symbiosis linked with the steel sector</p>	<p>Literature, stakeholders, Symbio-Steel Tasks</p>	<p>CSM or the partners who find it</p>	<p>Symbio-Steel Consortium, Industrial Symbiosis experts, Steelmaking and process industry, Energy intensive industries, Scientific Communities, Environmental Scientists, Students</p>	<p>PDF, XLS/XLSX, DOC/DOCX, JPG, PNG</p>	<p>Up to 50 files, Up to 500 MB</p>	<p>PU, CON (if confidential technologies info/data)</p>
<p>Data on gaps, boundary conditions and future opportunities for industrial symbiosis</p>	<p>ANA, SUR</p>	<p>Outlines gaps, boundary conditions and future opportunities for steel-based industrial symbiosis</p>	<p>Symbio-Steel Tasks</p>	<p>CSM or the partners who find/define it</p>	<p>Symbio-Steel Consortium, Industrial Symbiosis experts, Steelmaking and process industry, Energy intensive industries, Scientific Communities, Environmental Scientists, Social</p>	<p>PDF, DOC/DOCX</p>	<p>Up to 50 files, Up to 500 MB</p>	<p>PU</p>



					Scientists, Policy Makers, Students			
Info on R&I issues and optimal use of funding opportunities	ANA	Outlines R&I issues and optimal use of funding opportunities	Symbio-Steel Tasks	CSM or the partners who find/define it	Symbio-Steel Consortium, Steelmaking and process industry, Energy intensive industries, Scientific Communities, Environmental Scientists, Social Scientists	PDF, DOC/DOCX	Up to 10 files, Up to 100 MB	PU
Guidelines for implementation of IS pathways and improve synergies in steel industry	PRO, ANA	Outline steps to be followed for an efficient implementation of industrial symbiosis pathways	Symbio-Steel Tasks	FEhS or the partners who define it	Symbio-Steel Consortium, Industrial Symbiosis experts, Steelmaking and process industry, Energy intensive industries, Scientific Communities, Environmental Scientists, Social Scientists, Workers	PDF,DOC/DOCX	Up to 10 files, Up to 100 MB	PU
Roadmaps and scenarios for Industrial Symbiosis	REF, PRO	Provide reference data from existing Industrial symbiosis focused roadmaps and scenarios to be	Literature, Reports, Stakeholders	The partners who found it	Symbio-Steel Consortium	PDF, DOC/DOCX	Up to 10 files, Up to 100 MB	PU



		used for all the different activities to be developed in Symbio-Steel						
Barriers and challenges to industrial symbiosis	ANA, SUR	Outline main barriers and challenges to an extensive application of industrial symbiosis	Symbio-Steel Tasks	FEhS or the partners who define it	Symbio-Steel Consortium, Industrial Symbiosis experts, Steelmaking and process industry, Energy intensive industries, Scientific Communities, Environmental Scientists, Social Scientists, Workers, Students, Policy Makers	PDF, DOC/DOCX	Up to 10 files, Up to 100 MB	PU
Stakeholders survey and interview data	SUR	Obtain data and information from stakeholders to be used in Symbio-Steel activities	Stakeholder survey and interview	The partners who collect it	Symbio-Steel Consortium	PDF, XLS/XLSX, DOC/DOCX	Up to 500 files, Up to 3 GB	CON



5. Allocation of resources

Cost for respecting this DMP, making data FAIR, and for their preparation and check are generally personnel costs. Further costs can be related to storage, backup, preservation, maintenance, sharing, open access of research data and publications and security. All these costs have been already included in the project costs and are eligible for reimbursement, still considering that retroactivity claims are not possible.

Although the aim of the consortium is to preserve the data for a sufficiently long period of time, it must be also considered that the costs for long-term preservation of data after the end of the project are difficult to estimate at this stage, as they depend on the final amount of data collected and generated, and are strictly related to the services offered by repositories, e.g., Zenodo offer free of charge uploading of maximum 50 GB files.

Data Management is planned in WP1 and must be applied by all partners in all WPs under the guidance of DMP Committee and the supervision of the DMP Coordinator (see subsection 2.3). In particular, DMP Coordinator, as responsible for DMP implementation has dedicated person-months in WP1 for the development and implementation of this DMP, data access plans, right management and required documentations for main repositories. In addition, they communicate DMP to all the partners. On their side, Symbio-Steel partners are responsible for DMP implementation within the WPs where they are involved and for all the data they collect, process and generate.

To ensure DMP is continuously respected, a dedicated time slot would be reserved at the project general assemblies if needed. Updates will be provided about the DMP application on data collected, exploited and generated with particular attention on the reasons which led to the definition of a specific dataset confidential or suitable for public dissemination.

The project coordinator, i.e., SSSA, is hosting the OneDrive cloud-based exchange folder for all Symbio-Steel partners to allow the sharing and the alignment of communication, reporting documents and data among the partners of the consortium.

6. Data Security

Data security will be granted through different actions. In particular, multiple copies of all the documents and data sets circulated during the project will be stored in different repositories to avoid data losses:

- In local private repositories of the responsible partner, without public access
- in a duplicated backup hard disk
- In the project OneDrive in case data is accessible to all the Consortium
- In Zenodo or similar repositories, in case of data suitable to be public

In addition, resident backup servers will be used to store documents and datasets for at least one year later Symbio-Steel conclusion.

If possible, confidential and sensitive data/information will be anonymized before sharing to preserve the anonymity of the data provider. However, confidential data and information will be normally circulated through encrypted files with password only among partners responsible for the specific activity involving the handling of these data.

Finally, GDPR compliant procedures for data recovery, secure storage and transfer will be applied.

7. Other research outputs

This DMP rules also all the other research outputs not directly mentioned that may be generated or reused throughout Symbio-Steel project. Among these outputs, there are workflows, procedures, deliverables, reports, etc.

List of Figures

Figure 1. Data type definition flowchart.	9
Figure 2. Data accessibility definition flowchart.....	10
Figure 3. Open-access data uploading steps.....	18

List of Tables

Table 1. Data types	6
Table 2. Accessibility data classification.....	7
Table 3. Roles and responsibilities for DMP application and support	11
Table 4. Metadata attributes	20
Table 5. List of expected Symbio-Steel data.....	23

List of Acronyms and Abbreviations

Abbreviation/Acronym	Description
ANA	Analysis
CC	Creative Common
CC-BY-SA	Creative Commons Attribution-Share Alike
DES	Design
DM	Data Management
DMP	Data Management Plan
DMP_CM	DMP Committee
DMP_CR	DMP Coordinators
DMP_U	DMP Users
DOI	Digital Object Identifier
EC	European Commission
EXP	Experimental
FAIR	Findability, Accessibility, Interoperability, and Reusability
GDPR	General Data Protection Regulation
IMG	Image
IND	Industrial
IPR	Intellectual Property Rights
PDC	Project Data Contact
PRO	Protocol
Q&RM	Quality and Risk Manager
REF	Reference
SIM	Simulation
SUR	Survey
TXT	Text
WP	Work Package