D 7.2

Data Management Plan

APRE

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#GEOSYNPROJECT

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Partners short names

APRE	AGENZIA PER LA PROMOZIONE DELLA RICERCA EUROPEA
UNIFI	UNIVERSITA DEGLI STUDI DI FIRENZE
COSVIG	CONSORZIO PER LO SVILUPPO DELLE AREE GEOTERMICHE
SDU	SYDDANSK UNIVERSITET
GU	NGO GEOTHERMAL UKRAINE
SINTEF	SINTEF AS
SINTEF ER	SINTEF ENERGI AS
RIVACOLD	RIVACOLD SRL
NEO ECO	NEOECO DEVELOPPEMENT
S.M.F.	FORMAGGERIA TOSCANA S.R.L.

Abbrevations

DMP	Data Management Plan
FAIR	Findable, Accessible, Interoperable, Reusable
IPR	Intellectual Property Rights
DIForm	Data_Identification_Form

Executive Summary

This deliverable, entitled Data Management Plan (DMP), has been developed within the framework of the GEOSYN project which is funded by the European Union's Horizon Europe Research and Innovation Framework Programme.

This deliverable describes the data management life cycle for the data to be collected, processed and/or generated by the GEOSYN partners. As part of making research data findable, accessible, interoperable and re-usable (FAIR), the Data Management Plan (DMP) provides a summary of the main elements that should be considered in the definition of the GEOSYN data management policy to be used by the project partners throughout the project activities.

The Four Basics of FAIR:

'Findable'	i.e. discoverable with metadata, identifiable and locatable by means of a standard identification mechanism.
'Accessible'	i.e. always available and obtainable; even if the data is restricted, the metadata is open.
'Interoperable'	i.e. both syntactically parseable and semantically understandable, allowing data exchange and reuse between researchers, institutions, organisations or countries.
'Reusable'	i.e. sufficiently described and shared with the least restrictive licences, allowing the widest reuse possible and the least cumbersome integration with other data sources.

The DMP provides indications about the management of all the data generated during the project activities, including how data will be collected, managed, stored and made available during the project and how they will be shared after the project ends.

The information contained in this DMP will represent a key point of reference for all project activities and facilitates also the creation of a common understanding among partners on data management during project life but also in the long term (project data preservation).

1. Data management in GEOSYN - Overview

1.1. Objectives of the DMP

This DMP aims to describe the overall data management process within GEOSYN, which data are generated and how they will be collected, managed, processed, stored and made available during the life of the project, as well as how they will be preserved and shared beyond. This is an important aspect of any research project and therefore it is essential to plan effective data management from the early stages.

The goal of this data management plan is to mitigate the risk of data loss or other threats that could render the data illegible or unusable. Good data management is not a goal, but rather is the key conduit essential for knowledge discovery and innovation, as it stimulates data and knowledge integration and reuse by the community after the data publication process[1]. Given this, all data collected and generated during the GEOSYN project will be managed following the FAIR principles to be Findable, Accessible, Interoperable, and Reusable.

The management of data generated during the project will aim to ensure open access, as stated in the Article 29.3 of the Grant Agreement, taking into account the principle of "as open as possible, as closed as necessary", to guarantee the adoption of appropriate measures to preserve project results that can be further exploited in the future. Thus, the project will pursue a balance between openness and protection of information, commercialization and Intellectual Property Rights (IPR), privacy concerns, security, etc. If project partners need to keep certain parts of their data closed, this choice will be explicitly indicated in this DMP.

1.2. The overall structure of the Data Management Plan

GEOSYN Data Management Plan (DMP) specifically:

- provides an overview of the data that will be collected and processed, where data management is required;
- describes where and how the data generated by the project activities will be stored (information about the IT infrastructure used will be also provided);
- details how data will be documented to ensure that new members of the GEOSYN team and/or any possible (secondary) users are able to understand and reuse the data;
- describes the level of data confidentiality and the responsibility of the individual organizations, within GEOSYN, involved in the data collection processes;
- describes how the data will be shared and where they will be deposited for preserving all the material produced.

[1] Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018 (2016). https://doi.org/10.1038/sdata.2016.18

1.3. DMP updates

APRE, as responsible of the T7.2., will be responsible for coordinating the data management with the active support of the scientific coordinator, UNIFI, WP Leaders and Task Leaders.

The initial development of the DMP and future updates has been based mainly on the collection of information on datasets, filled out by each project partner responsible for producing such data in the relevant WP/task. The form used to collect this information (i.e. '*Data_Identification_Form' - DIForm)* has been prepared by APRE to track this primary information on the data that will be collected: data summary, standards/formats used, data accessibility and findability, data archiving and presentation and data interoperability.

The final DMP deliverable (.pdf) and the DIForms filled in, will be available to all partners in the project SharePoint, in the folder called 'Deliverables - Submitted'.

However, the DMP is a living document that will be updated as appropriate during the project lifetime according to project's needs and in case significant changes arise (e.g. new datasets, changes in consortium policies about data, changes in consortium composition, and so on). Should a new dataset be identified during the project implementation, the partner/s generating the data will submit a new DIForm with the information on the newly identified dataset and will inform the coordinator. The Coordinator will then be responsible for updating the document and its annexes.

The editable copy of the final DMP deliverable together with the newly submitted DIForm will be stored in the folder called 'WP7 Project Management - Task 7.2 - Data Management Plan'.

Evidence of these changes (if any) will be provided in the periodic evaluation/assessment of the project (period reports).

2. Data Summary

2.1. Information on Type of Data

During the GEOSYN project, various types of data will be collected. This section describes the data that will be collected.

In GEOSYN the following categories of data will be collected:

Experimental data: observational or measurements data, raw data collected during
Technical Data: comprehensive data/information often derived from secondary data.
Stakeholders Data: such as contact details or any other (personal) data of stakeholders. The collection may involve registration forms to events, newsletter subscription, website database, etc. The handling of those data will take into account GDPR and all information will be provided in GEOSYN D7.3 Ethical Issues Report.
Video files: recordings created with contents coming from all the work packages, such as stakeholders interviews and online info sessions, that will be used for communication and dissemination purposes and published through the GEOSYN and partners' channels.
Image files: photos of events or other activities e.g. from the study cases.
Deliverables, technical reports, publications: documentation generated as official project outputs or for knowledge dissemination.
Furthermore, the identified categories can occasionally overlap, and data can belong to more than one category depending on the specificities of the data itself. Moreover, it is worth to point out that **administrative/financial data** (data strictly related to the management of the project, e.g. meeting minutes, collection of information about partners' expenditure, etc.) is not included in the technical data definition, and in GEOSYN project it will be considered 'other data'.

2.2. Overview of GEOSYN datasets

This first version of the GEOSYN DMP mapped 10 datasets whose key details are summarized in Table 1.

TABLE 1 SUMMARY GEOSYN DATASETS

DATASET NAME	PARTNER	ORIGIN	TYPE	WP/Task	FORMAT	ACCESSIBILITY
Data and materials related to women entrepreneurship in geothermal_APRE	*1*	*Generated*	*Textual data, image and voice*	*WP5 / SubTask 5.2.1*	*doc/.docx,.pdf, jpeg, .htm, .mp4*	*Open data*
GEOSYN_Heat_Powered_Refrigeration_Cycle_and Geothermal_Integration_UNIFI	*2*	*Generated*	*Textual data and image*	*WP2 / Task 2.2, 2.4*	*.csv, .odt, .txt, .jpeg, .pdf*	*Open data*
DATASET1_Existing_geothermal_H&C_in_industry	*3*	*Generated*	*Textual data and image*	*WP1/T1.2*	*.xls/.xlsx and .htm*	*Open data*
DATASET2_Initial_social_acceptance	*3*	*Generated*	*Textual data*	*WP1/T1.3*	*.doc/.docx and .xls/.xlsx*	*Sensitive*

DATASET3_Final_level_social &industry_acceptance	*3*	*Generated*	*Textual data*	*WP1/T5.1*	*.doc/.docx and .xls/.xlsx*	*Sensitive*
GEOSYN_Dynamic_Simulation_SDU	*4*	*Generated*	*Textual data*	*WP3 & WP4 / Task 3.3, 3.4 & 4.3*	*.csv, .odt, .txt, .jpeg, .pdf*	*Open data*
Industry Stakeholders Mapping	*5*	*Generated*	*Textual*	*WP1/T1.1*	*.doc/.docx, .xls/.xlsx, .kml, .pdf*	*Open data*
Stakeholder Interview Results	*5*	*Generated*	*Textual*	*WP1/T1.1*	*.doc/.docx, .pdf*	*Open data*
Stakeholders Contacts	*5*	*Generated*	*Textual*	*WP1/T1.1 and WP5/T5.2*	*.xls/.xlsx*	*Open data*
Cluster Projects Mapping	*5*	*Generated*	*Textual*	*WP6/T6.2*	*.doc/.docx, .xls/.xlsx, .pdf*	*Open data*

2.3. GEOSYN detailed datasets information

This section of the deliverable provides detailed information for each dataset listed in the table in the previous section.

Partner n. 1	APRE

1. DATA SUMMARY	DATASET N° 1
Dataset name	*Data and materials related to women entrepreneurship in geothermal_APRE*
Data Origin	*Generated within the project*
Dataset description	*The dataset will be useful to perform impact studies and to use the materials in communication and capacity building activities after the end of the project*
Dataset type	*Stakeholders*
WP/Task of reference	*WP5 / SubTask 5.2.1*
File format	*doc/.docx,.pdf, jpeg, .htm, .mp4*
Expected size of data	*1 GB*
Data collection	*Data will be collected through online research, interviews, recording of videos and podcasts (voices) and processed to produce high educational and communication materials.*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*APRE*
Partner in charge of the data analysis	*APRE*
Partner in charge of the data storage	*APRE*
Partner that owns the data	*APRE*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*The data be openly accessible*
How will data be made accessible	*The data will be shared in a trusted repository*
Reusability requirements	*The data will be easily reusable as they will be published.*
4. DATA ARCHIVING AND PRESERVATION	

Storage and backup strategy	*APRE uses Zenodo to publish HORIZON EUROPE projects results beyond the tools offered by the European Commission.*
Data security	*Sensitive data will not be transferred.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*None*
Will established vocabularies for datasets will be used or Standard ones	*Standard vocabularies will be used*
Keywords	*Entrepreneurship, women, STEM*
6. RESOURCES NEEDED	
Resources allocated	*The actions are strictly connected with the task described in the Description of Action of the GEOSYN Grant Agreement*
7. Legal & Ethics	
Ethical issues	*All ethical issues will be treated in D7.3*
Protection of personal data	*How data processing will be compliant with data protection laws (e.g. GDPR) will be treated in D7.3. Minors are not a target audience for GEOSYN project.*
Intellectual Property Rights	*Results will be freely available to third parties.*

Partner n. 2	**UNIFI**

1. DATA SUMMARY	**DATASET #2**
Dataset name	GEOSYN_Heat_Powered_Refrigeration_Cycle_and Geothermal_Integration_UNIFI
Data Origin	*Generated within the project*
Dataset description	*Model Design and Validation, Optimization solution*
Dataset type	*Results Analysis*
WP/Task of reference	*WP2 / Task 2.2, 2.4*
File format	*.csv, .odt, .txt, .jpeg, .pdf*
Expected size of data	*Less than 500 MB*
Data collection	*Data will be generated using Python, Matlab, Excel and Word*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*UNIFI*
Partner in charge of the data analysis	*UNIFI*
Partner in charge of the data storage	*UNIFI*
Partner that owns the data	*UNIFI*

3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	Data be openly accessible
How will data be made accessible	Direct handling of data requests
Reusability requirements	Microsoft Office/open-source alternatives (e.g., LibreOffice), open-source PDF reader, open-source image reader
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*Disciplinary and institutional*
Data security	*The data generated is primarily stored on the UNIFI and GEOSYN Microsoft SharePoint platform to ensure data recovery and continuity. Access to both storage locations is restricted to authorized users. Data shared with collaborators is done through SharePoint or other secure institution-approved channels, ensuring that sensitive information remains protected.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*Each datasets will include detailed documentation (in .txt format) with model descriptions, input parameters, simulation conditions, and output variables. Supporting information such as parameter files, system configuration, and assumptions will also be provided to ensure clarity, reproducibility, and correct interpretation of the dataset.*
Will established vocabularies for datasets be used or Standard ones	*Creator:* *Title:* *Publication year:* *Date created:* *Description:* *Language:*
Keywords	*Heat powered refrigeration cycle, heat pump, geothermal energy, integration*
6. RESOURCES NEEDED	
Resources allocated	*Not applicable*
7. Legal & Ethics	
Ethical issues	*Not applicable*
Protection of personal data	Not applicable
Intellectual Property Rights	Not applicable

Partner n. 3	COSVIG

1. DATA SUMMARY	DATASET N° 3
Dataset name	*Existing_geothermal_H&C_in_industry*
Data Origin	*Generated within the project*
Dataset description	*The dataset will help raising technological and scientific literacy and awareness of industry actors potentially interested in using geothermal heating and cooling, of the general public and policy makers. In addition,*

	relevant industries will be further surveyed to report on their satisfaction degree and have deeper insights on barriers and challenges of using geothermal energy. *Beneficiaries: H&C intensive companies, citizens, policy makers.* *In addition, data gathered will be used to plan activities in WP5.*
Dataset type	*Technical data*
WP/Task of reference	*WP1/Task1.2*
File format	*.xls/.xlsx and .htm*
Expected size of data	*500 MB*
Data collection	*Data are being initially collected through literature review, results from other EU funded projects, networks and associations/organisations and from the partners' own information. Missing information are being asked directly to companies.* *In addition, a survey will be launched through the most relevant newsletters of the geothermal sector to collect missing case studies and information.* *Data collected will be published on the project website, through an open access database.*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*COSVIG*
Partner in charge of the data analysis	*COSVIG*
Partner in charge of the data storage	*COSVIG*
Partner that owns the data	*COSVIG*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*Data will be openly accessible*
How will data be made accessible	*Data will be indexed in a public catalogue, with one sheet per case study.* *The online database will be a WebGIS, with each case study georeferenced.*
Reusability requirements	*None*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*Data will be stored into COSVIG's institutional cloud (OneDrive) and on the GEOSYN Project SharePoint, during the research. In the long term, data will be stored into COSVIG's institutional cloud, in an external hard disk (for backup), on the Project website and on a Zenodo repository*
Data security	*Confidential and non-publishable data will be stored in protected internal folders, both on the staff computers and on an external hard disk, for backup.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*Data collected per each case study will be the following:* - *Case study title* - *Contacts of the company* - *Website* - *Address* - *Industrial sector and kind of production*

	- *Total Heating and/or cooling installed capacity* - *Total energy consumption* - *Starting year of geothermal H&C integration* - *% of energy sources used to cover the H&C demand* - *Thermal energy storage in your system* - *Short description of the case studied* - *Economic aspects* - *Environmental aspects* - *Social aspects* - *Barriers and challenges in using geothermal energy* *Depending on each specific case, not all the data above will be publicly accessible on the Project website.* *Case studies will be identified according to their reference industrial sector and country. Specific tags will help to quickly find case studies and data.*
Will established vocabularies for datasets be used or Standard ones	*Creator:* *Title:* *Publication year:* *Date created:* *Description:* *Language:*
Keywords	*Early provisional keywords: map of geothermal in industry, industrial heating and cooling, industrial H&C, geothermal case studies, geothermal heating and cooling, geothermal H&C, green industry, sustainable industry, geothermal production processes, decarbonized production lines, geothermal direct uses.*
6. RESOURCES NEEDED	
Resources allocated	*Research and the publication of the open access online database will be fully covered by the project grant.*
7. Legal & Ethics	
Ethical issues	*None*
Protection of personal data	*All data will be treated according the actual GDPR rules.* *Access to data will be limited to internal and authorized personnel only and all data will be anonimyzed in order to preserve the security and integrity of personal data.* *All raw data will be stored in cloud protected and with limited access to authorized personnel only and destroyed at the end of the elaboration process.*
Intellectual Property Rights	*No restrictions on the use of publicly available data, but the source of data should be cited.*

Partner n. 3	**COSVIG**

1. DATA SUMMARY	**DATASET N° 4**
Dataset name	*Initial_social_acceptance*
Data Origin	*Generated within the project*
Dataset description	*Assess the initial level of awareness and social acceptance Ukraine and Italy, including economic aspects and environmental concerns on geothermal energy technologies and geothermal H&C integration in industry.* *These data will be integrated by the results of two engagement workshops, to be held in Ukraine and Italy.*

	Data gathered will be used by the project consortium, to plan initiatives within the WP5, namely in Tasks 5.1, 5.2, 5.3 and 5.4.
Dataset type	*Results of multiple-choice questionnaires on awareness and social acceptance.*
WP/Task of reference	*WP1/Task1.3*
File format	*.doc/.docx and .xls/.xlsx*
Expected size of data	*500 MB*
Data collection	*Data will be collected through multiple-choice questionnaires, to be distributed online and through hard copies.*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*COSVIG (and GU for Ukraine)*
Partner in charge of the data analysis	*COSVIG*
Partner in charge of the data storage	*COSVIG*
Partner that owns the data	*COSVIG*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*Sensitive. The database of surveys won't be fully openly accessible, but results will be presented as aggregated.*
How will data be made accessible	*Deliverable 1.3, presentations and scientific publications.*
Reusability requirements	*None*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*Data will be stored into COSVIG's institutional cloud (OneDrive), the GU's internal storing systems and on the GEOSYN Project SharePoint, during the research. In the long term, data will be stored into COSVIG's institutional cloud and in an external hard disk (for backup).*
Data security	*Confidential and non-publishable data will be stored in protected internal folders, both on the staff computers, on an external hard disk, for backup, and on a Zenodo repository.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*The metadata will consist of demographic information, self-assessment of geothermal technologies and acceptance of geothermal energy and its integration into production lines*
Will established vocabularies for datasets be used or Standard ones	*Creator:* *Title:* *Publication year:* *Date created:* *Description:* *Language:*
Keywords	*Social acceptance; social engagement; geothermal energy; citizen survey; geothermal H&C*
6. RESOURCES NEEDED	

Resources allocated	*Research and the publication of the open access online database will be fully covered by the project grant.*
7. Legal & Ethics	
Ethical issues	*None*
Protection of personal data	*All data will be treated according the actual GDPR rules.* *Access to data will be limited to internal and authorized personnel only and all data will be anonimyzed in order to preserve the security and integrity of personal data.* *All raw data will be stored in cloud protected and with limited access to authorized personnel only and destroyed at the end of the elaboration process.*
Intellectual Property Rights	*No restrictions on the use of publicly available data, but the source of data should be cited.*

Partner n. 3	**COSVIG**

1. DATA SUMMARY	**DATASET N° 5**
Dataset name	*Final_level_social&industry_acceptance*
Data Origin	*Generated within the project*
Dataset description	*Assess the final level of awareness and social acceptance in Ukraine and Italy, including economic aspects and environmental concerns on geothermal energy technologies and geothermal H&C integration in industry.* *These data will be integrated by the results of two mobilization and mutual learning workshops, to be held in Ukraine and Italy.* *Data gathered will be used by the project consortium to improve communications to industries and citizens (Tasks 5.1 and 5.2), and draft policy recommendations (Task 5.4).*
Dataset type	*Results of multiple-choice questionnaires on awareness and social acceptance.*
WP/Task of reference	*WP5/Task5.1*
File format	*.doc/.docx and .xls/.xlsx*
Expected size of data	*500 MB*
Data collection	*Data will be collected through multiple-choice questionnaires, to be distributed online and through hard copies.*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*COSVIG (and GU for Ukraine)*
Partner in charge of the data analysis	*COSVIG*
Partner in charge of the data storage	*COSVIG*
Partner that owns the data	*COSVIG*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*Sensitive The database of surveys won't be fully openly accessible, but results will be presented as aggregated.*

How will data be made accessible	*Deliverable 5.2, presentations and scientific publications.*
Reusability requirements	*None*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*Data will be stored into COSVIG's institutional cloud (OneDrive), the GU's internal storing systems and on the GEOSYN Project SharePoint, during the research. In the long term, data will be stored into COSVIG's institutional cloud and in an external hard disk (for backup).*
Data security	*Confidential and non-publishable data will be stored in protected internal folders, both on the staff computers, on an external hard disk, for backup, and on a Zenodo repository.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*The metadata will consist of demographic information, self-assessment of geothermal technologies and acceptance of geothermal energy and its integration into production lines*
Will established vocabularies for datasets be used or Standard ones	
Keywords	*Social acceptance; social engagement; geothermal energy; citizen survey; geothermal H&C*
6. RESOURCES NEEDED	
Resources allocated	*Research and the publication of the open access online database will be fully covered by the project grant.*
7. Legal & Ethics	
Ethical issues	*None*
Protection of personal data	*All data will be treated according the actual GDPR rules.* *Access to data will be limited to internal and authorized personnel only and all data will be anonimyzed in order to preserve the security and integrity of personal data.* *All raw data will be stored in cloud protected and with limited access to authorized personnel only and destroyed at the end of the elaboration process.*
Intellectual Property Rights	*No restrictions on the use of publicly available data, but the source of data should be cited.*

Partner n. 4	**SYDDANSK UNIVERSITET - SDU**

1. DATA SUMMARY	**DATASET N° 6**
Dataset name	*GEOSYN_Dynamic_Simulation_SDU*
Data Origin	*Generated within the project*
Dataset description	*Model validation, development of control strategies and virtual case study analysis*
Dataset type	*Results analysis*
WP/Task of reference	*WP3 & WP4 / Task 3.3, 3.4 & 4.3*
File format	*.csv, .odt, .txt, .jpeg, .pdf*
Expected size of data	*500 MB*
Data collection	*Data will be generated using MATLAB/Simulink, Excel and Word*

2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*SYDDANSK UNIVERSITET*
Partner in charge of the data analysis	*SYDDANSK UNIVERSITET*
Partner in charge of the data storage	*SYDDANSK UNIVERSITET*
Partner that owns the data	*SYDDANSK UNIVERSITET*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*Data be openly accessible*
How will data be made accessible	*Direct handling of data requests*
Reusability requirements	*Microsoft Office/open-source alternatives (e.g., LibreOffice), open-source PDF reader, open-source image reader*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*Disciplinary and institutional*
Data security	*The data generated is primarily stored on the SDU and GEOSYN Microsoft SharePoint platform to ensure data recovery and continuity. Access to both storage locations is restricted to authorized users. Data shared with collaborators is done through SharePoint or other secure institution-approved channels, ensuring that sensitive information remains protected.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*Each datasets will include detailed documentation (in .txt format) with model descriptions, input parameters, simulation conditions, and output variables. Supporting information such as parameter files, system configuration, and assumptions will also be provided to ensure clarity, reproducibility, and correct interpretation of the dataset.*
Will established vocabularies for datasets be used or Standard ones	*Creator:* *Title:* *Publication year:* *Date created:* *Description:* *Language:*
Keywords	*Dynamic simulation, case studies, ramp-up, start-up, heat pump*
6. RESOURCES NEEDED	
Resources allocated	*Not applicable*
7. Legal & Ethics	
Ethical issues	*Not applicable*
Protection of personal data	*Not applicable*

Intellectual Property Rights	*Not applicable*

Partner n. 5	**Geothermal Ukraine - GU**

1. DATA SUMMARY	**DATASET N. 7**
Dataset name	*Industry Stakeholders Mapping*
Data Origin	*Generated within the project*
Dataset description	*This dataset is designed to support the assessment of various industries and the identification of potential industrial applications for the integration of GEOSYN solution. It will be particularly useful for policymakers, energy planners, researchers, and industry stakeholders seeking to evaluate where geothermal energy can be most effectively utilized to enhance sustainability and energy efficiency.*
Dataset type	*Stakeholders*
WP/Task of reference	*WP1/T1.1*
File format	*.doc/.docx, .xls/.xlsx, .kml, .pdf*
Expected size of data	*10 MB*
Data collection	*Data will be collected through extensive online research, including information sourced from industry websites, publicly available annual reports, technical documents, research publications, and government or institutional databases. The data gathering process will focus on identifying relevant industrial sectors, where geothermal energy can be effectively utilised.* *To ensure consistency and accuracy, the collected data will undergo a standardized preprocessing workflow. This includes validation, filtering of irrelevant content, and categorization based on name of* ***industry, industry type, geographical location, key industrial processes, process temperature ranges, heat carriers used, specific heating and cooling needs, the potential for cascade use of geothermal heating and cooling, and the geothermal potential of the region, website*** *— as far as possible and consistent with confidentiality standards. This structured approach will enable effective analysis and identification of opportunities for integrating geothermal energy within various industrial contexts and identify additional sites in Europe, for a thorough assessment of GEOSYN technology replicability.* *For processing and analysis, tools such as Microsoft Excel, and Google Earth (for spatial mapping and visualization) will be used.* *This approach will enable the creation of a comprehensive, structured dataset that highlights industrial sectors with the highest potential for geothermal energy integration.*
PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*Geothermal Ukraine*
Partner in charge of the data analysis	*Geothermal Ukraine*

Partner in charge of the data storage	*APRE, Geothermal Ukraine*
Partner that owns the data	*Geothermal Ukraine*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*The produced stakeholder mapping dataset—including the name of the industry, industry type, geographical location, and website—will be openly accessible to the public. Additionally, five selected industry case studies will be made publicly available. These case studies will provide key technical data such as process temperature ranges, heat carriers used, specific heating and cooling needs, and other relevant parameters for evaluating the potential integration of the GESOYN system. However, any sensitive or proprietary information obtained directly from the industries will be managed in accordance with confidentiality agreements and will not be disclosed.*
How will data be made accessible	*The dataset will be shared through a relevant stakeholder data catalogue, provided as an annex to Deliverable D1.1. It will be published on the official GEOSYN website in the appropriate section to maximize visibility and usability for researchers, policymakers, and other stakeholders.* *For any data not suitable for public release due to confidentiality constraints, interested parties may submit direct data access requests, which will be evaluated on a case-by-case basis in accordance with the terms of any existing confidentiality agreements or data sharing policies.*
Reusability requirements	*The dataset will be provided in widely-used, machine-readable formats such as .pdf readable by Adobe Acrobat Reader and Excel, ensuring ease of access and compatibility with common data analysis tools. No proprietary software will be required to open or view the data.* *For users wishing to perform mapping visualization, standard tools such as Google Earth can be used by uploading stakeholder database in .kml format.*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*During the research activities, the dataset will be stored on secure, organizational servers that comply with relevant data protection and security standards. These servers will be regularly backed up to ensure data integrity and minimize the risk of data loss. Additionally, for collaborative purposes, cloud storage services provided by project coordinator will be used for shared access among project partners.*
Data security	*All data will be stored on secure institutional servers that adhere to best practices for data protection, including access control mechanisms to restrict access to authorized personnel only.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*The dataset will be accompanied by clear and comprehensive documentation explaining its structure and content. This will include a data dictionary describing each variable (e.g., key industrial processes, process temperature ranges, heat carriers used) and the units of measurement to ensure consistency in interpretation. The data will be searchable by keywords, geographic location, industry type, and other relevant criteria, making it easy to identify and access.*

Will established vocabularies for datasets be used or Standard ones	*No specific metadata standards will be used for this dataset, as the data structure is straightforward and will be accompanied by clear documentation and a data dictionary to ensure usability.*
Keywords	*Geothermal energy, industrial processes, heating and cooling, process temperature, heat carriers, geothermal integration, industry, stakeholder mapping, cascade use, industrial heat demand, GEOSYN, industrial sectors.*
6. RESOURCES NEEDED	
Resources allocated	*Dedicated time and human resources have been allocated for data collection, processing, documentation, and management throughout the project. All costs will be covered centrally by the coordinating institution as part of the overall project budget. Where applicable, partner institutions will also contribute in-kind support for local data handling and validation.*
7. Legal & Ethics	
Ethical issues	*All data collection and handling activities will adhere to relevant ethical standards and codes of conduct, including ethical principles and guidelines of HORIZON Europe Programme according to Article 19 of the Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013*
Protection of personal data	*If any personal data is collected during the project—such as names, contact details, or responses from industry stakeholders—it will be processed in full compliance with the data protection rules according to the regulation (EU) 2016/679 of the European parliament and of the Council of 27 April 2016 on the protection of natural persons with regard the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data protection Regulation).* *Geothermal Ukraine does not designate a Data Protection Officer because none of the criteria in Art. 37 sub. 1 of the General Data Protection Regulation (GDPR) are met in the case of APRE, defined an internal regulation for data management and protection, and included a privacy team in its organization chart coordinated by Renato Fa mail: privacy@apre.it*
Intellectual Property Rights	*The dataset will primarily consist of originally collected and publicly available data, ensuring open access and reusability. However, in cases where third-party data (e.g. from industry reports, or company websites) is used, re-use will be subject to the original source's licensing and intellectual property rights.* *Such data will be clearly referenced, and any restrictions on its reuse will be respected in accordance with applicable copyright and licensing terms. No proprietary content will be shared without explicit permission from the rights holders.*

Partner n. 5	**Geothermal Ukraine - GU**

1. DATA SUMMARY	**DATASET N. 8**
Dataset name	*Stakeholder Interview Results*
Data Origin	*Generated within the project*

Dataset description	*This dataset will include insights from interviews with industrial stakeholders to understand their energy profiles, key processes, and potential for adopting geothermal energy solutions, with a focus on the GEOSYN heat pump system.*
Dataset type	*Technical and General Data*
WP/Task of reference	*WP1/T1.1*
File format	*.doc/.docx, .pdf*
Expected size of data	*10 MB*
Data collection	*Data will be collected through phone interviews and, where applicable, physical meetings with stakeholders. The dataset is structured into four sections: (1) General Company Information, (2) Energy Profile & Industrial Processes, (3) Geothermal Energy Awareness & Potential, (4) GEOSYN Solution & Future Considerations. All responses will be documented in the form of notes. The collected data will be processed and summarized in Deliverable D1.1, presented in a generalized form without identifying individual stakeholders.* *No specialized software tools were used for data processing or visualization. For processing only Adobe Acrobat Reader, Microsoft Word and Microsoft Excel will be used.*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*Geothermal Ukraine*
Partner in charge of the data analysis	*Geothermal Ukraine*
Partner in charge of the data storage	*APRE, Geothermal Ukraine*
Partner that owns the data	*Geothermal Ukraine*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*The data will not be openly accessible, as it could contains sensitive information shared by stakeholders. Data will be presented only in aggregated form within publicly available Deliverable D1.1 in .pdf format.*
How will data be made accessible	*The interview result analysis will be published in Deliverable D1.1, which will be made available on the official GEOSYN website in the relevant section to maximize visibility and usability for researchers, policymakers, and other stakeholders.*
Reusability requirements	*The data can be accessed and used with basic text processing software (e.g. Adobe Acrobat Reader, Microsoft Word, Excel) for viewing and analyzing the aggregated results.*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*The result analysis will be stored on secure, organizational servers that comply with relevant data protection and security standards. These servers will be regularly backed up to ensure data integrity and minimize the risk of data loss. Additionally, for collaborative purposes, cloud storage services provided by project coordinator will be used for shared access among project partners.*

Data security	*All data will be stored on secure institutional servers that adhere to best practices for data protection, including access control mechanisms to restrict access to authorized personnel only.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*To ensure the correct interpretation of the interview results in D1.1, a brief description of the data structure, a glossary of terms, and explanations of key concepts, such as stakeholder roles and the context of the interview questions, will be provided.*
Will established vocabularies for datasets be used or Standard ones	*No specific metadata standards will be used for this data.*
Keywords	*Stakeholder Interviews, Industrial Energy Profile, Geothermal Integration, Energy Efficiency, Energy Awareness, Industrial Processes, Sustainable Energy, Heat Pump Technology, Geothermal Awareness*
6. RESOURCES NEEDED	
Resources allocated	*Dedicated time and human resources have been allocated for data collection, processing, documentation, and management throughout the project. All costs will be covered centrally by the coordinating institution as part of the overall project budget. Where applicable, partner institutions will also contribute in-kind support for local data handling and validation.*
7. Legal & Ethics	
Ethical issues	*All data collection and handling activities will adhere to relevant ethical standards and codes of conduct, including ethical principles and guidelines of HORIZON Europe Programme according to Article 19 of the Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013*
Protection of personal data	*If any personal data is collected during the project—such as names, contact details, or responses from industry stakeholders—it will be processed in full compliance with the data protection rules according to the regulation (EU) 2016/679 of the European parliament and of the Council of 27 April 2016 on the protection of natural persons with regard the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data protection Regulation).* *Geothermal Ukraine does not designate a Data Protection Officer because none of the criteria in Art. 37 sub. 1 of the General Data Protection Regulation (GDPR) are met in the case of APRE, defined an internal regulation for data management and protection, and included a privacy team in its organization chart coordinated by Renato Fa mail: privacy@apre.it*
Intellectual Property Rights	*The results analysis will primarily consist of originally collected and publicly available data, ensuring open access and reusability. However, in cases where third-party data (e.g. from industry reports, or company websites) is used, re-use will be subject to the original source's licensing and intellectual property rights.* *Such data will be clearly referenced, and any restrictions on its reuse will be respected in accordance with applicable copyright and licensing terms. No proprietary content will be shared without explicit permission from the rights holders.*

Partner n. 5	Geothermal Ukraine - GU

1. DATA SUMMARY	DATASET N. 9
Dataset name	*Stakeholders Contacts*
Data Origin	*Generated within the project*
Dataset description	*This dataset contains contact details and engagement records of stakeholders collected through registration forms for webinars (under WP1/T1.3) and the online "Industry Engagement Café" events (under WP5/T5.2). It supports communication, dissemination, and collaboration activities within the project.*
Dataset type	*Stakeholder Data*
WP/Task of reference	*WP1/T1.1 and WP5/T5.2*
File format	*.xls/.xlsx*
Expected size of data	*10 MB*
Data collection	*Data will be collected through an online registration form completed by stakeholders when signing up for webinars and online sessions. The collected information will be processed and managed using standard spreadsheet tools, specifically Microsoft Excel. Personal data such as name, surname, email address, company/organization, and position will be gathered.*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*Geothermal Ukraine*
Partner in charge of the data analysis	*Geothermal Ukraine*
Partner in charge of the data storage	*APRE, Geothermal Ukraine*
Partner that owns the data	*Geothermal Ukraine*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*The data will not be openly accessible. It will be used exclusively for project-related purposes, specifically for mailing and communication with stakeholders in the context of the project activities. Access to the data will be restricted to authorized project team members only.*
How will data be made accessible	*The data will not be shared publicly. It will be stored securely and accessed only by authorized project team members for internal use. If necessary, data may be shared internally within the consortium through secure means such as password-protected folders or project management platforms.*
Reusability requirements	*The data will be stored in standard spreadsheet .xlsx format, which can be accessed and used with commonly available software tools such as Microsoft Excel. No specialized software is required to access or reuse the data.*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*During the project, data will be stored on secure institutional servers managed by the respective partner organizations. As the data contains personal information and is not intended for public sharing, it may be deleted upon request from a registered stakeholder. All storage and backup practices*

	will be carried out in compliance with relevant data protection regulations, including the GDPR.
Data security	*All data will be stored on secure institutional servers that adhere to best practices for data protection, including access control mechanisms to restrict access to authorized team members involved in the project.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*The dataset will be accompanied by basic metadata and documentation to ensure clarity and usability within the project context. This will include a data description file outlining the structure of the dataset, definitions of each field (stakeholder name, email, organization, position), the purpose of data collection, and any relevant collection dates or sources (e.g. specific webinars or online "Industry Engagement Café" events).*
Will established vocabularies for datasets be used or Standard ones	*No specific metadata standards will be used for this data.*
Keywords	*Contact Personnel Data, Registration form, Industry Engagement, Public Engagement, GDPR Compliance*
6. RESOURCES NEEDED	
Resources allocated	*Dedicated time and human resources have been allocated for data collection, processing, documentation, and management throughout the project. All costs will be covered centrally by the coordinating institution as part of the overall project budget. Where applicable, partner institutions will also contribute in-kind support for local data handling and validation.*
7. Legal & Ethics	
Ethical issues	*All data collection and handling activities will adhere to relevant ethical standards and codes of conduct, including ethical principles and guidelines of HORIZON Europe Programme according to Article 19 of the Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013*
Protection of personal data	*If any personal data is collected during the project—such as names, contact details, or responses from industry stakeholders—it will be processed in full compliance with the data protection rules according to the regulation (EU) 2016/679 of the European parliament and of the Council of 27 April 2016 on the protection of natural persons with regard the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data protection Regulation).* *Geothermal Ukraine does not designate a Data Protection Officer because none of the criteria in Art. 37 sub. 1 of the General Data Protection Regulation (GDPR) are met in the case of APRE, defined an internal regulation for data management and protection, and included a privacy team in its organization chart coordinated by Renato Fa mail: privacy@apre.it*
Intellectual Property Rights	*The results analysis will primarily consist of originally collected and publicly available data, ensuring open access and reusability. However, in cases where third-party data (e.g. from industry reports, or company websites) is used, re-use will be subject to the original source's licensing and intellectual property rights.*

	Such data will be clearly referenced, and any restrictions on its reuse will be respected in accordance with applicable copyright and licensing terms. No proprietary content will be shared without explicit permission from the rights holders.

Partner n. 5	Geothermal Ukraine - GU

1. DATA SUMMARY	DATASET N. 10
Dataset name	*Cluster Projects Mapping*
Data Origin	*Generated within the project*
Dataset description	*This dataset will include the mapping of 10 or more relevant projects to facilitate synergies, foster collaboration, and enable the sharing of resources among them. It aims to promote innovation, knowledge exchange, and mutual growth in the field of geothermal energy, with a particular focus on the application of GEOSYN technology.* *By identifying common goals and complementary activities, the dataset will support joint dissemination efforts—such as the co-organization of online workshops, final events, policy briefs, and recommendations—enhancing the overall impact and visibility of the involved projects.*
Dataset type	*Technical Data*
WP/Task of reference	*WP6/T6.2*
File format	*.doc/.docx, .xls/.xlsx, .pdf*
Expected size of data	*10 MB*
Data collection	*Data will be collected through online research by gathering publicly available information about relevant projects. The dataset will include details such as the project name, objectives, official website, social media pages, start and end dates, funding programme, project ID or grant agreement number, and available contact information (e.g., email addresses).*
2. PARTNERS RESPONSIBILITIES	
Partner in charge of the data collection	*Geothermal Ukraine*
Partner in charge of the data analysis	*Geothermal Ukraine*
Partner in charge of the data storage	*APRE, Geothermal Ukraine*
Partner that owns the data	*Geothermal Ukraine*
3. DATA ACCESSIBILITY AND FINDABILITY	
Open availability of produced data	*The data will be compiled and processed using Microsoft Excel and presented in the publicly available report D6.2 – Ecosystem Building Plan. However, access to certain sensitive project-related details, such as personal contact information, may be restricted.*
How will data be made accessible	*The data will be made accessible through the GEOSYN website. The dataset will be included in the publicly available report D6.2, which will be hosted on the website for easy access and download in .pdf format.*

Reusability requirements	*The data can be accessed and used with basic text processing software Adobe Acrobat Reader, for viewing and analyzing the aggregated results.*
4. DATA ARCHIVING AND PRESERVATION	
Storage and backup strategy	*The result analysis will be stored on secure, organizational servers that comply with relevant data protection and security standards. These servers will be regularly backed up to ensure data integrity and minimize the risk of data loss. Additionally, for collaborative purposes, cloud storage services provided by project coordinator will be used for shared access among project partners.*
Data security	*All data will be stored on secure institutional servers that adhere to best practices for data protection, including access control mechanisms to restrict access to authorized personnel only.*
5. DATA INTEROPERABILITY	
Interoperability of data produced	*A brief description of the project's information, data dictionary, contact details, and explanations of the context of the synergies, will be provided.*
Will established vocabularies for datasets be used or Standard ones	*No specific metadata standards will be used for this data.*
Keywords	*Horizon Europe, Cluster Projects, Ecosystem Building, Knowledge Exchange, Project Collaboration, EU Projects, Synergies, Dissemination, Ecosystem Building, Joint Activities*
6. RESOURCES NEEDED	
Resources allocated	*Dedicated time and human resources have been allocated for data collection, processing, documentation, and management throughout the project. All costs will be covered centrally by the coordinating institution as part of the overall project budget. Where applicable, partner institutions will also contribute in-kind support for local data handling and validation.*
7. Legal & Ethics	
Ethical issues	*All data collection and handling activities will adhere to relevant ethical standards and codes of conduct, including ethical principles and guidelines of HORIZON Europe Programme according to Article 19 of the Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013*
Protection of personal data	*If any personal data is collected during the project—such as names, contact details, or responses from industry stakeholders—it will be processed in full compliance with the data protection rules according to the regulation (EU) 2016/679 of the European parliament and of the Council of 27 April 2016 on the protection of natural persons with regard the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data protection Regulation).* *Geothermal Ukraine does not designate a Data Protection Officer because none of the criteria in Art. 37 sub. 1 of the General Data Protection Regulation (GDPR) are met in the case of APRE, defined an internal regulation for data management and protection, and included a privacy team in its organization chart coordinated by Renato Fa mail: privacy@apre.it*
Intellectual Property Rights	*The results analysis will primarily consist of originally collected and publicly available data, ensuring open access and reusability. However, in cases where third-party data (e.g. from industry reports, or company websites) is used, re-*

	use will be subject to the original source's licensing and intellectual property rights. *Such data will be clearly referenced, and any restrictions on its reuse will be respected in accordance with applicable copyright and licensing terms. No proprietary content will be shared without explicit permission from the rights holders.*

3. FAIR Data

Making data findable, including provisions for metadata.

3.1. Making data findable, including provisions for metadata.

The data collected within GEOSYN will be organized to help interested users to clearly find them and reuse them.

3.1.1. File naming & Identifiers

GEOSYN open datasets will be carefully named by choosing file names that are informative and useful for both humans and machines. Name will be meaningful so to make easier for others to understand what the file contains and how it should be used.

Project's file names will have the project acronym, a string referring to the experimental technique/activity/objective the dataset is about, name of the organization, the dataset's version, and any other element useful to univocally identify the data files' content (see table below some examples).

3.1.2. Version Control

Data will be organized to keep track of different versions of the datasets, through the application of a version control system. A version control system (or revision control system) is a system that tracks incremental versions (or revisions) of files and, in some cases, directories over time. Improving the ability to consistently track and retrieve each version of a file can lead to more efficient collaboration and increased accuracy of research results. Through the version control system, the risk of losing information after modifications is minimized.

Versioning is important for long term-research data management where metadata and/or files are updated over time.

3.1.3. Keywords

For each dataset, the responsible Beneficiary has indicated a set of selected keywords aiming to maximise findability. Zenodo follows the DataCite Metadata Schema.

3.2. Making data accessible

With the aim to follow the FAIR principles and to stimulate the collaboration among partners, a few data storage tools have been selected. The selection was made having in mind the purposes and the end-users of the data stored, divided in tools appropriate:

a. for internal use and daily project activities data storing and backup, **and**

b. for guaranteeing the long-term storage of data.

3.2.1. Data storage and backup during project lifetime

GEOSYN storage tools used to carry out daily project activities are:

- **Microsoft SharePoint**: is a file hosting service and synchronization service operated by Microsoft as part of its web version of 365Office. It is a private space, created for the project activities, used by all beneficiaries to share working files and store temporary master copy of raw data that should be available for use by other beneficiaries for data processing. Only members of the consortium, after validation from the group administrator (i.e. APRE), can access this space.
- **Local drives, company cloud storage and external portable storage devices**: these are storage facilities that do not fall under surveillance of this data management plan. These are very common and convenient for individual short-term storage of data provided that security is respected.

The processed data generated by the project that need to be accessible to all consortium partners, will be stored in GEOSYN SharePoint site.

The data containing personal data and the data gathered through questionnaires, interviews, focus groups, workshops and through other data gathering methods used during the project will be anonymised by default; for the purposes of the project's activities (specifically stakeholders engagement related activities, as a crucial element of the project), with prior expressed consent to share personal data, they will be used and will not be made accessible for any third party. All processes are defined in GEOSYN D7.3.

Raw data like interview protocols and audio files will be shared within the consortium partners and with external open repositories only upon agreement of the participants (agreement via informed consent) and in an anonymised form. In the case of sharing the data in an open repository, the following formats would be shared: audio files, transcripts, aggregated files, interview guidelines, …

Confidential data and data collected for internal purposes will be stored in the secure facilities of the organization responsible for collecting the data and will be retained for two years after the end of project. If requested and agreed by the participants, data can be shared with other consortium members through the online repository.

In the case of data that cannot be accessible to public, it will be stored in Zenodo (to preserve it) but only the metadata will be public (in CC 0).

Details concerning the ownership, transfer and dissemination of projects results are defined in section 8 of the GEOSYN Consortium Agreement and shall be followed accordingly. The relevant rules of the Grant Agreement, in specific Article 13, Article 15, Article 16 and Annex 5, are also relevant and apply accordingly.

3.2.2. Long term data preservation

To be useful, findable and reusable over the long-term, public data will be stored on Zenodo and the European Commission tools. The Sensitive data will be stored in hard disks. ZENODO[3] will automatically assign a persistent identifier, namely a DOI, to datasets to allow easy citation and discoverability.

A GEOSYN Zenodo community will be created.

All data and items on ZENODO will be retained for the lifetime of the repository. This is currently the lifetime of the host laboratory CERN, which currently has an experimental programme defined for the next 20 years at least.

Each beneficiary has the possibility to upload the public data produced by their project activities in the community and a moderator (community curator, usually the Data management responsible partner) will validate it.

3.3. Making data interoperable

Datasets will be exported and stored in formats that are commonly accessible (e.g. .txt, .csv), including the associated metadata and additional comments and descriptive text to aid the interpretation of the data.

3.3.1. Format of the data and estimated size

Collected data come in various formats: electronic text, numeric, spreadsheets, multimedia, models, software languages, etc. For each dataset, it will be described the format of the data produced, with the ultimate goal to facilitate the accessibility and interoperability of the data, giving preferences to open and standard formats. In DIForm each partner responsible of the datasets provided a first estimation of the size of the data collected. This information will be updated (if needed) in the DMP final version according to the actual size of data collected eventually.

3.3.2. Metadata

All data are documented to help interested users to clearly find them and reuse them to ensure the interoperability of data and metadata, standard or community-endorsed vocabularies will be used when applicable. For this reason, descriptive and substantive (i.e. how the data should be read or interpreted) metadata will be elaborated and described in a “readme.txt” file complementing each dataset (see Table 4).

Table 4 Metadata included in the readme file of data

Creator*	Main partner name involved in producing the data.
Title*	Name or title by which the dataset is known.
Contributor	Institution where the data was created or collected. A person or organization responsible for making contributions to the dataset.
Publisher	A holder of the data (including archives appropriate) or institution which submitted the work. Any others may be listed as contributors.
Publication year*	The year when the data was or will be made publicly available.

Date created*	Date the resource itself was put together; this could be a date range or a single date.
Description*	Concise description of the contents of the dataset. Describe the research objective, type of research, method of data collection and type of data.
Subject	Subject, keyword, or key phrase describing the resource.
Temporal coverage	Indicate the dates to which the data refer. Enter the year or beginning and ending dates.
Spatial coverage	Describe the geographic area to which the data refer (e.g. municipality, town/city, region, country). The geographic coordinates of the area may be included, if desired.
Identifier	Zenodo automatically assigns a DOI to a dataset once the entire deposit procedure has been completed. In some cases, a dataset may be known by one or more other (persistent) identifiers.
Language*	The primary language of the resource.
Link to publication	Include the web addresses or DOIs for any publication, important internal reports or other datasets that are related to your dataset.

3.4. Increase data re-use

GEOSYN beneficiaries will be the main users of data produced in the project. However, in respect of the Grant Agreement rules (in specific Article 13, Article 15, Article 16 and Annex 5), and HE Programme Guide, research data generated during the project, will be made open as early as possible, with the exception of datasets that support unfinished peer-reviewed publications, patent applications, or information that cannot legally be made openly accessible (e.g. personal or sensitive data, following “as open as possible, as closed as necessary”).

In GEOSYN, all data have been classified into open, sensitive and closed. Access depends on the classification of the data:

- **Open data** must be acknowledged by citing the data set. Permission from the researcher is not required.
- **Sensitive** (or confidential/restricted data) may be made available by the researcher after any identifying information has been removed. Then, they can be used and cited. Permission from the researcher could be sought.
- **Closed data** are not available for sharing.

The access to research data will be provided through deposition in trusted repositories, as detailed in the previous paragraphs. Whenever possible, research datasets will be available under the Creative Commons Attribution 4.0 International (CC BY 4.0) license, allowing third parties to share and adapt data with no restrictions as long as attribution (i.e., citation) is provided.

4. Other research outputs

The database on existing geothermal H&C integrations will be developed to be easily accessible by external users. This database will be published online, a WebGIS on a specific section of the project website, with georeferenced points referred to each case study. A short text will describe the database, which will be linked to specific keywords to increase its findability.

The datasets with initial and final level of acceptance will be sensitive, however deliverables 1.3 and 5.2 will describe the methodology adopted to implement the surveys, including the structure of questionnaires. Results of the surveys will be publicly available as aggregated data, to describe the degree of acceptance of geothermal technologies in territories where the survey was conducted. Furthermore, findings will be used as a basis for further research on acceptance of geothermal energy, or in initiatives aimed at engaging surveyed communities.

5. Legal and Ethics

5.1. Protection of personal data

Since GEOSYN activities involve the processing of personal data, Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (GDPR) and other relevant EU-level[4] and relevant national legal acts shall be complied with and respected by the consortium as a whole, as well as by each project Beneficiary which will deal with personal data processing in the context of project implementation.

More information about personal data protection is included in D7.3 Ethical issues Report.

6. Other issues

6.1. Allocation of resources

The costs foreseen for data management are related namely to the working time needed to perform data collection at organization level.

For open data, it has been chosen the ZENODO for sharing and data preservation, which offers free data archiving up to 50GB per dataset which should be enough given the expected data volume indicated for public dataset by each.

7. Conclusions

This first version of the GEOSYN DMP mapped 10 datasets but the beneficiaries are still defining additional datasets that will be produced.

All beneficiaries are committed to open the data as much as possible taking into account that some data will be sensitive taking into account the important role of the industries involved in GEOSYN and their interest in exploiting the results in new products on the European and worldwide market.

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