



EU-SOLARIS ERIC

Data management plan

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Plataforma Solar de Almería (PSA)
Carretera de Senés, km. 4,5
04200-Tabernas (Almería)
Spain
Tel. +34 950 820812

eu-solaris.eu

Executive Summary

This document outlines the anticipated data outputs of **EU-SOLARIS ERIC**, along with the policies and strategies for managing, sharing, and preserving those data assets. It serves as a foundational version of the **EU-SOLARIS ERIC Data Management Policy**, applicable across the consortium's ongoing activities, services, and collaborations.

The core principles guiding data usage and exploitation are presented in the main body of the document, while **Annex 1** provides a detailed overview of the types of data generated by EU-SOLARIS ERIC members and facilities. Key topics covered include:

- Methodologies and standards for data and metadata generation
- Metadata sets and formats to be produced
- Procedures for ensuring data accessibility and strategic exploitation
- Classification of data (public vs. confidential) and justification for any restrictions
- Archival and safeguarding measures for data and metadata over the long term

This Data Management Policy is designed to **maximize the accessibility, transparency, and reusability** of data produced within the EU-SOLARIS ERIC framework, in full alignment with the **FAIR data principles** (Findable, Accessible, Interoperable, and Reusable). At the same time, it ensures that the **intellectual property and strategic interests** of EU-SOLARIS ERIC and its partners are appropriately protected.

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1	August 2025	Essam, Martínez	
2			
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LIST OF ABBREVIATIONS

BNN	Board of National Nodes
CSP/STE	Concentrating Solar Power / Solar Thermal Energy
ERIC	European Research Infrastructure Consortium
ESFRI	European Strategy Forum on Research Infrastructures
GA	General Assembly
IPR	Intellectual property rights
KPI	Key Performance Indicator
MD	Managing Director
RI	Research Infrastructure
SLA	Service Level Agreement
STC	Scientific & Technical Committee
CA	Consortium Agreement
CST	Concentrating Solar Thermal
DMP	Data Management Plan
DOI	Digital Object Identifier
EC	European Commission
OA	Open Access
R&D	Research and Development
ZENODO	An open-access repository for research data
FAIR	Findable, Accessible, Interoperable, and Reusable
IEC	International Electrotechnical Commission

1. Overview

EU-SOLARIS ERIC is committed to supporting the long-term sustainability and innovation capacity of European research infrastructures in the field of Concentrated Solar Thermal (CST) technologies. This Data Management Policy establishes clear principles and operational guidance to ensure that all data generated through EU-SOLARIS ERIC activities adheres to **Horizon Europe's standards for responsible data stewardship**.

The policy provides a framework for making research-related data **open, accessible, and reusable**, while also protecting sensitive, proprietary, or security-critical information where necessary. This approach directly supports EU-SOLARIS ERIC's broader mission of enabling collaboration between research institutions, industry, and national nodes, and of fostering **international cooperation, knowledge exchange, and sustainable energy innovation**.

2. Analysis

This policy defines the categories of EU-SOLARIS ERIC data that may be made publicly available and outlines conditions under which access must be restricted—for example, to safeguard intellectual property rights, confidentiality agreements, or strategic competitive advantages.

The policy ensures full alignment with the **FAIR data principles** (Findable, Accessible, Interoperable, and Reusable). It also specifies the protocols for metadata standardization, storage, and archival, and supports the continued development of e-infrastructures for Remote and Virtual Access (RA/VA) to CST Research Infrastructures across Europe.

Through these measures, EU-SOLARIS ERIC reinforces transparency, scientific reproducibility, and stakeholder engagement, contributing to the long-term advancement of CST research and large-scale infrastructure services.

3. Call to Action

All members, facilities, and project partners under the EU-SOLARIS ERIC umbrella are expected to contribute to the **continuous improvement and regular review of data management practices**, in alignment with evolving research needs and updated European Commission guidelines.

By adhering to these principles, EU-SOLARIS ERIC ensures that CST-related data remains a **valuable asset for scientific and industrial innovation**, while maintaining robust safeguards for ethical, legal, and strategic interests. Cross-sector collaboration will continue to be central to this effort, reinforcing EU-SOLARIS ERIC's role as a pan-European driver of excellence in solar thermal research and sustainable infrastructure development.

4. Purpose and Scope of the Policy

The **EU-SOLARIS ERIC Data Management Policy** serves as a comprehensive framework for the collection, documentation, storage, sharing, and long-term preservation of data generated across the ERIC's activities. This includes scientific data, metadata, operational information, and communication records associated with **Concentrated Solar Thermal (CST)** technologies and supporting infrastructures.

The policy ensures compliance with **Horizon Europe's Open Science principles**, including the FAIR data guidelines (Findable, Accessible, Interoperable, and Reusable), and reinforces EU-SOLARIS ERIC's role in advancing transparency, interoperability, and knowledge-sharing across the European research ecosystem.

It also addresses the **responsible handling of confidential or sensitive data**, supporting the ERIC's strategic mission to foster innovation, enable effective industry collaboration, and contribute to sustainable and equitable energy solutions in Europe.

5. Integration with EU-SOLARIS ERIC Activities

This Data Management Policy is a core component of EU-SOLARIS ERIC's governance and operational model. It underpins a wide range of activities, including:

The coordination of CST Research Infrastructures (RIs) and provision of transnational and virtual access

- The development of harmonized testing standards and protocols
- Capacity-building and training of early-stage researchers
- Collaboration with national nodes, industry stakeholders, and international partners
- Digitalization and performance monitoring of CST technologies
- Strategic planning and service innovation

By ensuring that data generated within these domains is properly managed, shared, and preserved, the policy enhances the scientific, societal, and economic impact of EU-SOLARIS ERIC. It also supports the ERIC's objectives of strengthening managerial and technical capacities, fostering awareness of CST technologies, and contributing to the environmental sustainability of European solar research infrastructures.

6. Data Overview

As a European Research Infrastructure Consortium (ERIC), **EU-SOLARIS ERIC** facilitates the generation, curation, and use of diverse datasets across a wide range of activities related to **Concentrated Solar Thermal (CST) technologies**. These datasets are essential for enhancing innovation, supporting long-term

sustainability, expanding access to CST infrastructures, and fostering international and industrial collaboration.

EU-SOLARIS ERIC activities are structured around functional domains that produce and manage specific types of data. Examples include:

- **Governance and Sustainability (e.g. Coordination, National Nodes, Membership Expansion):**
Data includes strategic plans, institutional collaboration records, national engagement outcomes, and feedback from networking events and staff mobilities. These datasets support governance, impact assessment, and the long-term development of the ERIC structure.
- **Innovation and Industry Engagement:**
This includes technical protocols, standardization outputs, and industrial feedback related to CST systems and testing procedures. These datasets help drive co-development with industry and inform policy and market adoption of CST technologies.
- **Research Infrastructure Access and Digitalization:**
EU-SOLARIS ERIC collects infrastructure usage statistics, service demand records, and documentation on **Remote and Virtual Access (RA/VA)**. These datasets inform decisions on service delivery, user support, and cross-infrastructure harmonization across Europe. They also capture synergies with other energy sectors and digital tools.
- **Sustainability and Resource Efficiency:**
Data in this domain includes **environmental impact assessments**, water and electricity consumption metrics, and sustainability guidelines aimed at reducing the environmental footprint of CST operations.
- **ERIC Coordination and Management:**
Administrative datasets include financial and progress reports, project meeting records, internal assessments, and governance documents. These support strategic alignment, funding compliance, and operational monitoring.

The data generated and managed by EU-SOLARIS ERIC is not only essential for internal planning and performance tracking, but also serves the wider research community, industry stakeholders, and policymakers involved in Europe's sustainable energy transition. Some datasets build upon outputs from past or ongoing EU-funded projects (e.g. SFERA-III, INSHIP, SOLARIZE) and national-level research infrastructure initiatives, ensuring continuity and interoperability.

7. Data Provenance and Generation

Data generated within the **EU-SOLARIS ERIC framework** originates from a wide array of coordinated activities involving its member research infrastructures (RIs), national nodes, and affiliated stakeholders. The data reflects both institutional-level contributions and researcher- or user-driven inputs, supporting strategic objectives, operational efficiency, and cross-border collaboration.

The primary sources of data include:

Governance and Community Development Activities

Data is collected through networking events, stakeholder consultations, early-stage researcher (ESR) mobilities, and national outreach campaigns. It includes:

- Participant records, contact details, and feedback forms
- Reports on institutional collaborations and membership expansions
- Strategic documentation such as governance plans, roadmaps, and national node evaluations

These datasets support the long-term structuring of the ERIC and its integration into the European Research Area (ERA).

Innovation Promotion and Standardization Work

Technical data is generated through collaboration with industry and standards bodies. Key sources include:

- Testing campaigns and field trials for CST components
- Stakeholder feedback from industrial workshops
- Protocols for performance metrics, certification, and safety standards

This data feeds into innovation pipelines and helps align CST research infrastructure services with market and regulatory needs.

Infrastructure Operations and Remote Access

Operational data is gathered through monitoring tools, user interactions, and digital platforms, including:

- Real-time performance metrics (e.g., temperature, pressure, irradiation) from CST systems
- Usage statistics and access logs from RA/VA services
- Feedback from users of the EU-SOLARIS e-infrastructure

This supports the optimization and harmonization of infrastructure services across Europe.

Sustainability and Greening Measures

Data in this domain focuses on improving environmental performance at CST research infrastructures, including:

- Water and energy consumption data from solar fields and test loops
- Carbon footprint assessments and lifecycle impact reports
- Simulation and validation data for alternative cooling and cleaning strategies

This information enables the development of best practices for resource efficiency and climate-conscious infrastructure design.

Administrative and Strategic Management

These datasets include:

- Financial records, audit reports, and budget allocations
- Internal meeting minutes, consortium documentation, and KPIs
- Communication and dissemination metrics from EU-SOLARIS outreach activities

Such information ensures robust governance, compliance with EU regulations, and effective resource allocation.

Ensuring Long-Term Data Accessibility

As a pan-European research infrastructure, **EU-SOLARIS ERIC** is committed to maintaining long-term accessibility and traceability of the data it generates or curates. This includes internal strategic documentation, operational metrics from CST research infrastructures, technical standards, and collaborative outputs from EU-funded projects and international partnerships.

Primary Storage via the EU-SOLARIS ERIC Website

- All relevant datasets and documentation are stored in the **EU-SOLARIS ERIC website's internal platform**, which is managed by the central coordination team and supported by institutional backup systems.
- The website platform enables **centralized access, structured documentation, and traceable archiving** for project partners and consortium members.
- Internal and restricted-access data (e.g. meeting minutes, strategy papers, contact databases) are stored securely with appropriate access controls.

8. Public Access via ZENODO

- When datasets are intended for public release (e.g. research results, sustainability guidelines, standard protocols), they are published via **ZENODO**, under an **EU-SOLARIS ERIC community collection**.

- ZENODO ensures:
 - Persistent identifiers (DOIs) for citability
 - Open metadata under CC0
 - Long-term digital preservation through CERN's infrastructure
- Published datasets are also **cross-referenced on the EU-SOLARIS ERIC website** to maintain central visibility and traceability.

Embargo and Access Control

- Public datasets may be subject to a **6-month embargo** after production or publication, in line with Horizon Europe guidelines.
- Sensitive datasets (e.g. those containing personal, financial, or industrial information) will remain internal or shared under controlled access, with clear justification and documentation.

Data Retention and Redundancy

- All data stored via the ERIC website platform is backed up using secure institutional systems to ensure data redundancy and long-term preservation (minimum 5 years, unless otherwise required).
- Internal data is version-controlled and archived with accompanying metadata to ensure usability and provenance over time.

Discoverability

- Public metadata associated with both internal and external datasets is openly available to enable discoverability, even when underlying datasets are under restricted access.
- EU-SOLARIS ERIC aims to align its metadata standards with **EOSC practices** and international research infrastructure guidelines.

9. FAIR Data

Making Data Findable, Including Provisions for Metadata

EU-SOLARIS ERIC follows the **FAIR principles** to ensure that all relevant datasets are structured and documented in ways that support discoverability, citation, and long-term utility.

Persistent Identifiers (DOIs)

- Publicly available datasets are published via **ZENODO**, which assigns **Digital Object Identifiers (DOIs)** to each dataset.

- These DOIs enable consistent referencing and integration into scientific publications, project deliverables, and EU repositories (e.g. CORDIS, OpenAIRE).

Metadata Standards

- All published datasets include rich metadata describing:
 - Title and description of the dataset
 - Creator(s), institution(s), and funding source
 - Date of generation and publication
 - Licensing terms and access conditions
 - Versioning information and associated projects
- Metadata complies with ZENODO's schema (based on **Dublin Core** and **DataCite**) and is openly harvestable by third-party platforms (e.g. EOSC, OpenAIRE).

Internal Dataset Indexing

- Internally stored datasets (e.g. coordination documents, access logs, technical reports) are indexed via the **EU-SOLARIS ERIC website's structured repository**, with:
 - Unique internal identifiers and revision tracking
 - Assigned categories (e.g. access, governance, sustainability)
 - Tagging by Work Package, year, or thematic area
- These records are accessible to authorized staff or members via controlled access and allow traceability of dataset lineage and context.

Searchability

- The EU-SOLARIS ERIC website features a searchable archive for both internal and public-facing content.
- Public datasets published on ZENODO are also **referenced and linked on the ERIC website**, ensuring unified visibility and searchability across platforms.

Dataset Documentation

- Where applicable, each dataset includes README files or data dictionaries to facilitate understanding, proper usage, and reusability by third parties.

Making Data Accessible

Open Access via ZENODO

- **Publicly shareable datasets** (e.g. protocols, guidelines, sustainability studies, non-sensitive test results) are published on **ZENODO** under the EU-SOLARIS ERIC community.
- These datasets are:
 - Free to access without login
 - Provided in machine-readable formats (CSV, PDF/A, JSON, etc.)
 - Accompanied by open licenses (e.g. **CC BY**, **CC0**) where feasible
 - Cited and cross-linked on the **EU-SOLARIS ERIC website**

Restricted or Controlled Access

Certain datasets may be **partially or entirely restricted**, including:

- Personal data (contact lists, feedback forms)
- Industry collaboration outputs under NDA
- Internal governance records and financial documentation
- Pre-publication or confidential research results

In these cases:

- Access may be provided **upon request** under specific conditions (e.g. signed data-sharing agreement)
- Summary metadata remains **publicly available**, indicating the dataset's existence and reason for restriction

Data Sharing Conditions

- Data access and reuse are governed by clear terms, including:
 - Licensing type (e.g. CC BY 4.0)
 - Reuse restrictions (e.g. non-commercial, no redistribution)
 - Attribution requirements
- EU-SOLARIS ERIC ensures that all shared data comply with **GDPR**, national regulations, and agreements with third parties.

Accessibility Support

- Accompanying documentation (README files, user guides, glossaries) is provided to assist external users in understanding and interpreting datasets.
- EU-SOLARIS ERIC supports **multilingual or graphical summaries** when relevant, especially for public-facing datasets that support outreach or policy engagement.

Making Data Interoperable

EU-SOLARIS ERIC will ensure that all datasets and their metadata are interoperable across the diverse fields of solar research and technology. The adoption of established metadata standards across the organization

will guarantee that data can be seamlessly integrated with related datasets, facilitating its reuse in new research contexts. For instance, the solar technology standards and testing protocols in EU-SOLARIS ERIC's projects will follow industry-standard terminology to enhance data compatibility across the solar energy sector.

Increasing Data Reuse

- **Documentation:** Comprehensive documentation will accompany all datasets, particularly those from EU-SOLARIS ERIC's solar thermal research and technology testing activities. This includes detailed readme files, codebooks, and methodological explanations, ensuring ease of reuse by both researchers and industry professionals. Clear documentation will support the replication of results and the continued development of solar technologies across Europe.
- **Licensing:** All datasets will be made available under open licenses, such as Creative Commons licenses, to encourage broad reuse while ensuring proper attribution. This approach aligns with EU-SOLARIS ERIC's commitment to fostering collaboration and advancing innovation within the solar energy sector.
- **Provenance and Data Quality:** The provenance of data will be carefully documented to support transparency and reproducibility. For example, datasets from solar infrastructure and field testing will include detailed logs of access requests, usage statistics, and virtual access metrics, ensuring a full audit trail of data usage. Routine quality checks will be performed to ensure the data's accuracy, reliability, and consistency throughout the lifecycle of each project.

By adhering to these FAIR principles, EU-SOLARIS ERIC aims to maximize the reuse and impact of the data generated through its activities, contributing to the ongoing advancement of solar technologies, energy policy, and sustainable industrial practices across Europe.

10. Data Management and Storage

The data management and storage strategy for EU-SOLARIS ERIC projects will prioritize long-term data preservation, accessibility, and compliance with relevant EU regulations and data protection laws, in line with the FAIR data principles (Findable, Accessible, Interoperable, and Reusable). EU-SOLARIS ERIC will oversee the management of data flow, ensuring all project data is efficiently organized and adheres to these principles. The strategy will implement robust measures for data storage, archiving, and sharing, supporting the sustainability and interoperability of the outcomes generated through the organization's activities.

Data Storage

Data generated during EU-SOLARIS ERIC projects will primarily be stored in the EU-supported ZENODO repository, a reliable and user-friendly platform designed for open data management. This repository ensures secure data storage, redundancy, and reliable backup solutions, providing easy access to project

partners and external stakeholders. Additionally, project partners may store data in their institutional repositories as needed, meeting specific institutional guidelines or providing additional backup and redundancy.

To ensure data findability and proper citation, each dataset will be assigned a Digital Object Identifier (DOI), which will allow for traceable referencing. Each dataset will also have comprehensive metadata, including technical, environmental, and project-specific details, enabling clear interpretation and effective reuse by other researchers, policymakers, and industry professionals.

Data will be made publicly available upon project completion, unless there is a specific need to share certain datasets or results earlier in the project timeline. All deliverables, milestones, and key results will be shared in a publicly accessible manner, promoting transparency, collaboration, and maximizing the impact of EU-SOLARIS ERIC's work within the scientific community and beyond.

Data Security

To ensure the integrity and confidentiality of sensitive data, EU-SOLARIS ERIC will implement a comprehensive set of security measures, overseen by the project coordinator:

- **Access Controls:** Strict access controls will be enforced, ensuring that only authorized personnel can access sensitive datasets. User access will be granted based on role requirements and project needs.
- **Encryption:** Sensitive data will be protected using strong encryption protocols, both for data at rest and during transmission, safeguarding it from unauthorized access at all stages of its lifecycle.

In addition to these internal measures, the **ZENODO repository** will play a critical role in the storage and security of project data. As a trusted platform, ZENODO follows rigorous security practices to ensure the protection of project datasets:

- **CERN Data Centre:** ZENODO's data centers are hosted at CERN, with physical access limited to a small group of trained staff who are granted access only as part of their professional duties. CERN staff do not have physical access to the ZENODO Data Centre, ensuring an additional layer of protection.
- **Servers:** ZENODO's servers are managed following CERN's Security Baseline for Servers, ensuring that only authorized personnel have remote access. The servers are regularly updated with the latest security patches to mitigate any vulnerabilities.
- **Network Security:** CERN's Security Team continuously monitors network traffic through intrusion detection systems to identify and respond to potential threats. All interactions with the ZENODO platform are conducted over HTTPS, ensuring data security during transmission.
- **Data Protection:** User passwords are stored using strong cryptographic hashing algorithms (PBKDF2+SHA512), and access tokens for external

services (e.g., GitHub, ORCID) are encrypted and can only be decrypted with the application's secret key.

- **Application Security:** ZENODO employs a range of techniques to protect user sessions from hijacking and ensures regular vulnerability scans are conducted to identify and fix potential application security issues.
- **Staff Oversight:** CERN staff with access to user data follow CERN Operational Circular No. 5, which limits access to user data to only what is necessary for task execution, troubleshooting, or security monitoring. Any misuse of data by staff will result in strict disciplinary or legal actions, ensuring the highest standards of data integrity and confidentiality.

11. Data Sharing and Dissemination

EU-SOLARIS ERIC is committed to the transparent sharing of data with key stakeholders, ensuring wide dissemination of research outcomes. This commitment will be achieved through a combination of traditional and innovative dissemination strategies, aimed at maximizing the impact of the data generated across its solar energy and research activities.

Sharing Strategies

Publications: Research results from EU-SOLARIS ERIC's activities will be disseminated through peer-reviewed journal articles, conference presentations, and scientific papers. These will ensure that results are accessible to the wider scientific community and contribute to the advancement of solar energy research and policy.

Online Platforms: Data and research outputs from EU-SOLARIS ERIC's projects will be made available through its website and the ZENODO repository, ensuring easy access to datasets, reports, and project findings. Relevant data will also be stored on internal platforms within EU-SOLARIS ERIC to support the sustainability of the organization's research and long-term data sharing goals.

Workshops and Seminars: EU-SOLARIS ERIC will organize a range of training sessions, workshops, and seminars focused on knowledge exchange, collaboration, and capacity building. These events will engage researchers, industry professionals, and policymakers, and the outcomes will be shared publicly after each activity to ensure broad dissemination of key insights.

Post-Activity Data Sharing: Following the completion of key activities, certain datasets, final reports, and summaries will be made publicly available. This ensures that stakeholders have access to the full scope of EU-SOLARIS ERIC's work and can build upon it for further research and innovation.

12. Responsibilities and Governance

Effective governance is crucial for the successful implementation of EU-SOLARIS ERIC's data management strategy. The responsibilities for data management will be clearly defined within the organization to ensure accountability, transparency, and efficient data handling.

Roles and Responsibilities

Director Manager: The Director Manager will provide overall strategic oversight of the data management process, ensuring alignment with the organization's objectives and guiding the data management efforts across all activities.

General Assembly: The General Assembly will serve as the main decision-making body, overseeing data management strategies and ensuring compliance with the Data Management Plan (DMP). It will also facilitate the approval of key policies and resolutions related to data sharing and governance.

Project Managers: Project Managers will oversee specific projects and activities within EU-SOLARIS ERIC, ensuring the implementation of data management protocols and the timely sharing of data outputs. They will coordinate with partners and internal teams to ensure data quality and compliance with the DMP.

Responsibilities

Each participating institution involved in EU-SOLARIS ERIC's activities will hold primary responsibility for the data generated within their respective experimental or research facilities. The data management and access policy will be coordinated centrally, ensuring consistency and compliance across all institutional partners. This hierarchical structure guarantees accountability and clarity in data management practices.

Governance Framework

EU-SOLARIS ERIC will establish a clear governance framework for data management, which will be overseen by the Director Manager, with input and guidance from the General Assembly. The director manager will regularly review data management practices, address challenges, and share best practices among internal teams and collaborators. This framework will support effective decision-making and continuous improvement in how data is managed, shared, and utilized.

13. Allocation of Resources, and Ethical Aspects

In alignment with the objectives of EU-SOLARIS ERIC, a dedicated budget will be allocated to ensure proper management of data and the open access (OA) publication of research results. This allocation will enhance the dissemination and sharing of data while ensuring compliance with the relevant guidelines and agreements, including Horizon Europe's ethical and open data requirements.

Ethical Considerations

thical considerations are fundamental within the framework of EU-SOLARIS ERIC's activities. The organization is committed to upholding the highest ethical standards in all data-related work. These ethical guidelines and regulations, particularly those set forth by Horizon Europe, will guide data management practices.

The following key ethical aspects will be addressed:

- **Informed Consent:** EU-SOLARIS ERIC ensures that informed consent procedures are rigorously implemented for all data collection activities involving human subjects, if applicable. Participants will be provided with comprehensive information regarding the data collection's purpose, how their data will be used, and their rights concerning privacy and confidentiality, in full compliance with the ethical standards of Horizon Europe.
- **Data Privacy and Confidentiality:** Stringent measures will be in place to protect the privacy and confidentiality of personal or sensitive data collected during the course of the activities. These measures will align with EU data protection regulations, including the General Data Protection Regulation (GDPR) and any relevant local regulations, ensuring that personal data is handled with the highest level of security and respect.
- **Compliance with Horizon Europe Regulations:** EU-SOLARIS ERIC will fully adhere to the ethical and data protection standards outlined in the Horizon Europe framework. This includes compliance with the Open Data principles, ensuring that data management practices promote openness, transparency, and accountability.
- **Ethics Review:** All data management and sharing practices will undergo regular reviews by EU-SOLARIS ERIC's internal committees, ensuring that all activities comply with Horizon Europe's ethical guidelines. This process ensures that the organization maintains the highest ethical standards in data management.
- **Transparency and Accountability:** EU-SOLARIS ERIC will maintain transparency in its data management practices and ethical considerations, providing clear documentation and communication to all stakeholders. Any deviations from established ethical guidelines will be transparently documented and addressed in accordance with Horizon Europe's reporting requirements.
- **Continuous Monitoring and Evaluation:** Ethical considerations will be continuously monitored and evaluated throughout the project to ensure compliance with Horizon Europe's ethical standards. Any emerging ethical issues will be promptly addressed and mitigated in line with the applicable guidelines and regulations.

14. Procedures

In alignment with the Data Management Plan (DMP), EU-SOLARIS ERIC will implement structured protocols for managing data effectively across its activities. These procedures are tailored to the specific objectives, activities, and data requirements outlined in the DMP. By defining clear guidelines for data collection, storage, sharing, and usage, the procedures will ensure adherence to best practices in data management while addressing ethical and privacy considerations to uphold the integrity and confidentiality of the data. The aim is to foster transparency, reproducibility, and collaboration in data management, supporting EU-SOLARIS ERIC's overall goals.

- **Data Collection, Acquisition, and Documentation:** This procedure outlines how data will be systematically collected, acquired, and documented during EU-SOLARIS ERIC's activities. It includes detailed protocols for data collection methodologies, the use of appropriate instrumentation, and comprehensive metadata documentation. This will ensure that data is properly described and stored, enabling accurate interpretation, reuse, and integration with other datasets.
- **Data Storage, Management, and Security:** This procedure establishes how data will be stored, managed, and secured throughout its lifecycle. It includes strategies for selecting secure data storage infrastructure, implementing version control mechanisms, ensuring data backup, and utilizing encryption methods. These measures will protect data from unauthorized access, loss, or corruption, ensuring compliance with data protection regulations like GDPR.
- **Data Access, Sharing, and Distribution:** This procedure defines the protocols for facilitating data access, sharing, and distribution among EU-SOLARIS ERIC's internal teams and external stakeholders. It covers the use of data-sharing platforms, setting appropriate access controls, and outlining dissemination strategies. This approach will support collaboration, promote transparency, and ensure that sensitive data is protected in accordance with intellectual property rights and privacy considerations.

By adhering to these procedures, EU-SOLARIS ERIC will enhance collaboration, promote data sustainability, and ensure continuous compliance with Horizon Europe's ethical standards throughout the organization's activities.

15. Communication Data and Contact Management

Data Shared via Email

EU-SOLARIS ERIC recognizes that email remains a practical medium for data exchange, especially in the early phases of collaboration or informal coordination across European research infrastructures.

To ensure security, traceability, and compliance:

- Sensitive data must not be stored long-term in email inboxes or attachments. Such data must be transferred to secure storage solutions (e.g., ZENODO, institutional repositories, internal SharePoint).
- Email attachments containing confidential or personal data should be encrypted or password-protected, especially when involving personal identifiers, proprietary documents, or pre-publication data.
- Email should not be used to transmit bulk datasets or long-term archives. Instead, it should link to secure and version-controlled repositories.

All EU-SOLARIS ERIC personnel and partners will be briefed on best practices for secure communication and the responsible forwarding of any data-related messages.

Contact Information from Projects and Events

As part of its mandate to foster collaboration, EU-SOLARIS ERIC collects and processes personal contact information from:

- Partner projects (e.g., Horizon Europe, SolarPACES, national initiatives)
- Stakeholders participating in events, workshops, surveys
- Researchers, industry representatives, or service users interacting with EU-SOLARIS ERIC facilities

To ensure GDPR compliance:

- Contacts will only be collected with valid legal basis (consent or legitimate interest)
- Data will be stored securely (e.g., encrypted contact lists, CRM tools)
- Recipients will be clearly informed of the purpose and their rights (including opt-out options)
- Contact data will be reviewed periodically and deleted when no longer needed

GDPR Alignment and Ethical Oversight

The director manager will:

- Monitor communications and contact data processing
- Provide staff with training on ethical handling of personal data
- Ensure privacy rights (access, rectification, erasure) are upheld
- Document any breaches or misuse of personal contact data

The policy is aligned with:

- EU General Data Protection Regulation (EU 2016/679)
- Horizon Europe Ethical Guidelines
- EU-SOLARIS ERIC's internal data governance and legal oversight

Appendix A: Email Disclaimer Template

Email Disclaimer (for EU-SOLARIS ERIC personnel and communications)

This email and its attachments may contain confidential and/or personal information intended solely for the recipient. If you are not the intended recipient, please notify the sender immediately and delete this message.

Any data or documents shared via this communication are subject to EU-SOLARIS ERIC's data governance policies and must not be distributed without prior authorization.

EU-SOLARIS ERIC operates in compliance with the General Data Protection Regulation (GDPR).

Appendix B: Contact Collection Consent Text

Consent for Contact Information Use

By submitting this form, I consent to EU-SOLARIS ERIC collecting and storing my contact information for the purposes of project communication, event follow-

up, and updates related to solar research infrastructures and innovation. I understand my data will be securely stored and not shared with third parties without my explicit permission. I may withdraw my consent at any time by contacting [info@eu-solaris.eu].

Annex 1: Data and Metadata Format

In this Data Management Plan, data and metadata for each of EU-SOLARIS ERIC's key activities will be presented in a structured format to ensure clarity, accessibility, and consistency. For each activity, a summary table will outline the objectives, expected datasets, metadata requirements, and relevant KPIs. The data section will describe the specific types of data anticipated, such as operational performance metrics, resource usage statistics, and project management records. The metadata section will define key attributes for each dataset, including document versioning, author(s), creation date, keywords, and brief summaries. Standardized file formats will be utilized across the organization to promote interoperability and ease of use. Common formats will include CSV (Comma-Separated Values) for tabular data, JSON (JavaScript Object Notation) for structured data exchanges, and PDF (Portable Document Format) for reports and documentation. This structured approach will enhance data organization, transparency, and the usability of datasets produced throughout EU-SOLARIS ERIC activities.

Data and Metadata List by Activity

Activity	Objectives	Expected Datasets	Metadata Requirements	KPIs
Activity 1	Establishing and enhancing the operational framework for EU-SOLARIS ERIC.	- Operational framework documents - Stakeholder engagement reports - Sustainability assessment reports	- Document versioning - Author(s) - Date of creation - Keywords - Summary/abstract	1. Number of user requests for access 2. Number of users served 3. Number of publications
Activity 2	Developing the research and innovation agenda for solar technologies and infrastructures.	- Research agenda documents - Innovation reports - Stakeholder consultation data	- Document versioning - Author(s) - Date of creation - Keywords - Summary/abstract	4. Percentage of top (10%) cited publications 5. Number of master and PhD students using the RI
Activity 3	Improving service capacities of	- Operational performance datasets (e.g.,	- Dataset versioning - Date of collection	6. Training of people who are not

Activity	Objectives	Expected Datasets	Metadata Requirements	KPIs
	research infrastructures and enhancing stakeholder engagement.	solar radiation, system efficiency) - Remote access guidelines - Service portfolio documents	- Sensor details (type, location) - Summary/abstract - Data access rights	RI staff 7. Number of members of the RI from ESFRI countries
Activity 4	Promoting sustainability and green technologies in solar energy research.	- Water usage metrics - Cooling efficiency data - Energy consumption data - Carbon footprint analysis	- Dataset versioning - Date of collection - Methodology used for data collection - Location of data collection - Summary/abstract	8. Share of users and publications per ESFRI member country 9. Share of users associated with industry and publications with industry
Activity 5	Project management and coordination, including financial and governance tracking.	- Progress tracking data - Financial reports - Governance framework documents - Quality assurance plans - Communication and dissemination strategies	- Document versioning - Author(s) - Date of creation - Keywords - Summary/abstract	10. Income from commercial activities and the number of entities paying for service 11. Engagement achieved by direct contact

Explanation of Metadata Requirements:

- **Document Versioning:** Ensures that different versions of documents are tracked, providing clarity on updates and changes.
- **Author(s):** Identifies the individuals or groups responsible for the creation or curation of the data or document.
- **Date of Creation:** Records when the document or dataset was created to provide context for its relevance.
- **Keywords:** Tags that describe relevant topics or terms, enabling easier searching, categorization, and discovery of datasets.
- **Summary/Abstract:** Provides a brief overview of the dataset or document, facilitating quick understanding of its content and purpose.
- **Dataset Versioning:** Similar to document versioning, this ensures the dataset's version history is clearly recorded, allowing for tracking of updates or revisions.
- **Date of Collection:** Indicates when the data was gathered, providing important context about its timeliness and applicability.
- **Sensor Details:** For operational data, identifying the types and locations of sensors used helps contextualize the data.
- **Methodology Used for Data Collection:** Describes the methods or techniques employed to gather the data, allowing for future replication or verification of results.
- **Location of Data Collection:** Specifies where the data was gathered, which is particularly relevant for environmental data to assess its geographical context.

Annex 2: Standard Operating Procedures (SOPs) for Data Management

Objective: Establishing Standard Operating Procedures (SOPs) to support data integrity, accessibility, and confidentiality across EU-SOLARIS ERIC's activities. These procedures ensure long-term sustainability and effective collaboration in line with the organization's goals of advancing research and innovation in solar energy technologies.

Data Collection, Acquisition, and Documentation

Data Overview: Data will include a wide range of information from EU-SOLARIS ERIC's activities, such as performance metrics from Concentrated Solar Thermal (CST) systems, participant information from workshops and training sessions, stakeholder engagement reports, research findings, and collaborative data from partner organizations.

Methodologies: Data will be gathered using a variety of methods:

- **Surveys:** To capture feedback from users and stakeholders.
- **Sensors and Loggers:** Standard sensors integrated with data loggers will monitor CST system performance, environmental conditions, and operational metrics.
- **Registrations:** Documentation of participant attendance and project milestones.
- **Experimental Setups:** Data generated from lab-based or field-testing experiments.
Comprehensive metadata will accompany each dataset to ensure its future discoverability and usefulness.
- **Standards:** SOPs will ensure data consistency, accuracy, and quality. All datasets will adhere to best practices for data documentation, and detailed metadata will be recorded for future usability, including information about data sources, collection methods, and formats.

Data Accessibility and Confidentiality

Public Access: A majority of the datasets, including research findings, performance data, workshop materials, and training resources, will be publicly available. These datasets will be archived in trusted repositories like ZENODO and EU solaris ERIC website, ensuring open access to promote transparency and research dissemination.

Controlled Access: Certain sensitive data, such as proprietary methodologies, partnership agreements, or non-public internal reports, will be subject to restricted access. This data will be governed by confidentiality agreements and can be accessed only by authorized personnel or stakeholders with a legitimate need to know.

Archiving and Preservation

Strategy: To ensure long-term accessibility, all data will be archived in EU-Solaris ERIZ website. This platform offers robust archiving solutions, ensuring that data is preserved for at least five years following the end of the project, meeting the long-term sustainability goals of EU-SOLARIS ERIC.

Backups: Data redundancy will be ensured through regular backups stored in both institutional repositories and cloud-based platforms. Backup protocols will be designed to protect data from loss, ensuring it is recoverable in the event of hardware failure or other disruptions.

Validation Procedures

Mechanisms: Validation will be a multi-step process that includes:

Participant Feedback: Data collected from workshops, training sessions, and consultations will be validated through direct feedback from attendees and stakeholders.

Peer Reviews: Scientific data, including performance metrics and research findings, will undergo peer review to ensure its accuracy and reliability.

Compliance Checks: Data will be regularly checked for compliance with EU regulations, international standards (e.g., ISO, FAIR principles), and best practices in research data management.

Automated System Audits: Specialized tools will be used to audit datasets for completeness, consistency, and errors. Automated checks will be implemented to flag anomalies and verify data quality.

Review Processes: Regular internal audits and reviews will ensure the ongoing compliance with data management standards. Additionally, periodic external reviews or expert consultations may be used to validate the quality of collected data, especially in areas such as CST performance testing and sustainability metrics.

Key Datasets Summary

Workshops and Training Data: This includes attendance records, participant feedback, and assessments from training sessions. Public summaries of workshop outcomes will be accessible, while detailed feedback and evaluation data will be kept confidential for internal use.

CST Performance Data: Collected from field testing and ongoing monitoring systems, this dataset will include metrics on system efficiency, energy output, operational performance, and environmental conditions (e.g., solar radiation, temperature). Some of these datasets will be anonymized and made publicly available to facilitate transparency and knowledge-sharing in the field of solar energy research.

Project Management Data: This includes governance documents (e.g., minutes from meetings), financial records (e.g., budget tracking), and dissemination strategies. Sensitive internal documents related to financial management and

strategic decisions will be stored securely and access will be granted only to authorized personnel.

These SOPs are designed to support **EU-SOLARIS ERIC's data integrity**, promote efficient data management practices, and ensure that all data is handled in a manner that is both transparent and compliant with regulatory and ethical standards. The structured approach to data management will help EU-SOLARIS ERIC foster collaboration, facilitate innovation, and contribute to the sustainability of the research ecosystem.