Data Management Plan

Deliverable No: D4.3

Work Package: WP4

Official delivery date: 30.06.2025

Actual delivery date: 30.06.2025

Funded by the European Union
Grant agreement ID: 101213413

DSOs FOR EUROPE

DSOs FOR DIGITAL TWINS

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Version	Date	Authors	Notes
1.0	30.06.2025	Stephan Gross, Ostins Gailis	Finalize first version of this working document

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List of Abbreviations and Acronyms

Acronym	Meaning
DTA	Digital Twin Activities
DESAP	Digitalisation of the energy system
EC	European Commission
EU	European Union
DSO	Distribution System Operator
TSO	Transmission System Operator
JTF	Joint Task Force
DMP	Data Management Plan

Executive Summary

The DSO4DT Data Management Plan (DMP) identifies and describes the datasets produced by the DSO4DT project that will be published. Upon reception of datasets from internal and external sources, DSO4DT will make datasets publicly available if feasible as well as through DSO4DT's key initiatives, including the DSO/TSO Technopedia (DSO Entity, 2025), DTA datasets (both qualitative and quantitative), Capacitypedia, and the Data Interoperability Repository. We will follow established good practices, following the FAIR principle and using the existing European infrastructure, notably the Zenodo platform (OpenAIRE, n.d.).

1 Introduction

Effective data management is a vital component of the DSO4DT project. Central to this, is a clearly defined and transparent process for handling data received from both external stakeholders and members of DSO Entity. To ensure accessibility and clarity in this process it is essential to promote active engagement from all parties, especially given the diverse partners involved within DSO4DTs Digital Twin network.

The Data Management Plan (DMP) outlines DSO4DT's approach to data handling. It addresses key aspects of data security, formatting, and defines the data management for all data that will be collected, processed, and generated throughout the project.

This document represents the initial version of the DSO4DT DMP and should be regarded as a living document. It will be regularly updated and refined over the course of the project to reflect new insights, developments, and data received.

To align with the FAIR principle (Findable, Accessible, Interoperable, and Reusable) the DSO4DT project will follow already established good practices on receiving, processing, storing, and publishing data. This DMP includes detailed information on:

- How data will be handled during and after the project
- What data will be collected, processed, and/or generated
- The methodologies used for data collection and processing
- Open access data

Through this FAIR principle, DSO4DT will ensure that all data managed and processed within the project, follows the guidelines outlined in this document.

1.1 Task 4.3

The development of DSO4DT's DMP is carried out under Task 4.3. This task is responsible for the continuous assessment and refinement of knowledge exchange, ensuring that all data and project outputs are managed in accordance with the FAIR principle.

1.2 Objectives of the work reported in this deliverable

The objective of this deliverable is to identify the type of data that DSO4DT will be handling, as well as outline how this data will be managed throughout the duration of this project.

1.3 Outline of the deliverable

The FAIR data principles and DSO4DT's approach to implementing them are outlined in Chapter 2. The data used in the DSO4DT project is assessed in Chapter 3 and organized into categories and key thematic topics addressed by the project. The allocation of resources to ensure the data is made "FAIR" is explained in Chapter 4. Chapters 5 and 6 are dedicated to the data security and ethical aspects defined within the project.

2 FAIR Data

DSO4DT will adopt the FAIR principle throughout the project, in line with the Guidelines on Data Management in Horizon 2020 (European Commission, n.d.). These principles not only govern how data is collected and used but also promote knowledge sharing.

The FAIR principles applied to data management in DSO4DT are defined as follows:

- **Findable**: Data must be easily located through clear titles, standardized methodologies, and consistent storage locations. It should be structured in a way that allows both humans and machines to efficiently discover and access it.
- **Accessible**: The DMP will define how data can be accessed during the project, ensuring that access is transparent and, where appropriate, secure.
- **Interoperable**: Data intended for publication and sharing should be formatted to allow integration across various platforms, disciplines, and workflows, supporting broader understanding.
- **Reusable**: The goal is to make data suitable for future use, clearly defining when, how, and for how long the data will be available.

By adhering to these principles, DSO4DT will foster an open, collaborative, and innovative research environment, supporting the long-term value of its data.

2.1 Making data findable

The FAIR Data Management Guideline asks:

• Are the data produced and/or used in the project discoverable with metadata, identifiable and locatable by means of a standard identification mechanism (e.g. persistent and unique identifiers such as Digital Object Identifiers)? • What naming conventions do you follow? • Will search keywords be provided that optimize possibilities for re-use? • Do you provide clear version numbers? • What metadata will be created? In case metadata standards do not exist in your discipline, please outline what type of metadata will be created and how.

The datasets identified in DSO4DT will be published following established good practices and utilise European infrastructure, such as the Zenodo repository if feasible (OpenAIRE, n.d.). Zenodo is a free, open-access platform developed by the European OpenAIRE programme and operated by CERN. It allows datasets to be uploaded and accessed for a wide range of research materials, including papers, datasets, software, and reports. Importantly, Zenodo complies with the FAIR principles, ensuring that data is Findable, Accessible, Interoperable, and Reusable.

Many of the datasets identified within the DSO4DT project will also be published across multiple platforms, including the DSO4DT website, the DSO/TSO Technopedia platform, the jointly developed Data Repository with ENTSO-E, and Capacitypedia - an initiative developed under Point 6 of the Grid Action Plan (European Commission, 2023). These platforms will serve both as dissemination channels and publicly accessible data storage hubs.

Given the diversity of data covering a wide range of topics, these platforms will function as centralized aggregators, enabling streamlined access to relevant information across the Digital Twin ecosystem.

The datasets will be contributed by external stakeholders, internal DSO Entity members, and participants from the Task Force on Digitalisation of the Energy System (TF DESAP). All collected data will be processed in a manner that ensures it is suitable for public dissemination, in alignment with the FAIR principles.

2.2 Making data openly accessible

The FAIR Data Management Guideline asks:

• Which data produced and/or used in the project will be made openly available as the default? If certain datasets cannot be shared (or need to be shared under restrictions), explain why, clearly separating legal and contractual reasons from voluntary restrictions. • How will the data be made accessible (e.g. by deposition in a repository)? • What methods or software tools are needed to access the data? • Is documentation about the software needed to access the data included? • Is it possible to include the relevant software (e.g. in open source code)? • Where will the data and associated metadata, documentation and code be deposited? Preference should be given to certified repositories which support open access where possible. • Have you explored appropriate arrangements with the identified repository? • If there are restrictions on use, how will access be provided? • Is there a need for a data access committee? • Are there well described conditions for access (i.e. a machine readable license)? • How will the identity of the person accessing the data be ascertained?

To ensure open access to data throughout the project, DSO4DT will only share data that is suitable for public dissemination. The project's core objective is to foster and grow an active Digital Twin community. To support this goal, DSO4DT will collaborate with partners willing to contribute data that is not subject to confidentiality restrictions and can be made publicly accessible.

All eligible data will be published on open platforms designed to promote knowledge sharing and the dissemination of best practices, further encouraging transparency, collaboration, and innovation within the Digital Twin ecosystem.

2.3 Making data interoperable

The FAIR Data Management Guideline asks:

• Are the data produced in the project interoperable, that is allowing data exchange and re use between researchers, institutions, organisations, countries, etc. (i.e. adhering to standards for formats, as much as possible compliant with available (open) software applications, and in particular facilitating re-combinations with different datasets from different origins)? • What data and metadata vocabularies, standards or methodologies will you follow to make your data interoperable? • Will you be using standard vocabularies for all data types present in your data set, to allow inter-disciplinary interoperability? • In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies, will you provide mappings to more commonly used ontologies?

Making data interoperable greatly focuses on identifying standards that promote appropriate use of data that can be utilised across DTAs. Thusly, DSO4DT will publish data that is uniform and utilises vocabulary that ensure broad stakeholder understanding. By applying this methodology and offering clear explanations of specific topics and terminology, DSO4DT will ensure broad stakeholder comprehension and effective data use.

2.4 Making data re-usable

The FAIR Data Management Guideline asks:

• What is the purpose of the data collection/generation and its relation to the objectives of the project? • What types and formats of data will the project generate/collect? • Will you re-use any existing data and how? • What is the origin of the data? • What is the expected size of the data? • To whom might it be useful ('data utility')?

DSO4DT datasets are to be published under an open license, if possible. This license allows the datasets to be used under the same licensing conditions, as well as continue to be accessible on Zenodo after the project.

3 Data Summary

The DSO4DT project foresees multiple streams of data generation, varying in scope, granularity, and thematic relevance. These data streams will be developed and shared in alignment with the specific topics addressed throughout the project's lifecycle. In addition to the initial data collection mechanisms described in Deliverable 1.1, particularly those related to stakeholder outreach and engagement with DTAs, the project will gather both quantitative and qualitative data to support a range of anticipated activities, that may include but not limited to:

1. **DTA-Sourced Datasets**
   Data obtained from DTAs that are directly relevant to the objectives and thematic areas addressed by DSO4DT.
2. **DSO/TSO Technopedia Platform**
   A shared digital platform co-hosted with ENTSO-E to catalogue and exchange technical knowledge, and digital solutions across TSOs and DSOs.
3. **Capcitypedia**
   A digital repository developed under the Grid Action Plan (Action 6), aimed at improving visibility on network capacity and planning tools.
4. **Data Interoperability Repository**
   A structured repository intended to collect datasets from the European Member States on their Energy Market Role Models and further data practises.

To ensure effective data handling and usability, DSO4DT will adopt an efficient data categorisation methodology. This approach will facilitate structured data management while maintaining alignment with the thematic focus areas of the project. Data will be sourced from a variety of formats and sources, including:

- Existing reports and documentation
- Good practice use-cases
- Online surveys and structured questionnaires
- Excel spreadsheets and data tables
- Direct submissions from stakeholders

In this context, several preliminary data categories are expected to be populated and maintained throughout the project:

- DSO/TSO Innovative Technology Use Cases
- Digital Twin Use Cases
- Capacity Map References and data
- Joint Repository Data with ENTSO-E

As DSO4DT is committed to promoting openness and transparency, all datasets generated or shared through the project are intended to be published as open data where possible, as well maintain all necessary procedures for data security.

3.1 Data Category 1: DSO/TSO Technopedia Applications

3.1.1 Data Set: Datasets for DSO/TSO Technology Descriptions

Overview (Optional)	
General description of the technology: What is it? How does it work? Existing different types of the technology.	
Challenges (Optional)	
What challenges or problems does the technology solve?	*General challenges that the technology helps addressing.*
Benefits (Optional)	
What are the benefits of the power system by adopting the technology? Explanation of the benefits of the technology in the power system (at both the distribution and transmission level, when applicable). Cite and link any relevant policy target that the technology can help to achieve. Cite and link relevant strategic documents such as ENTSO-E Research, Development and Innovation (RDI) Roadmap 2024-2034,[1] DSO Entity Technical Vision 2025[2], or similar relevant documents.	*General benefits deriving from the adoption of the technology – no measured nor calculated as they vary depending on the use cases.*
Current enablers (Optional)	
Market, regulation, standardisation, and technology aspects that already exist and help the adoption of the technology.	
R&D needs (Optional)	
Challenges to the development/adoption of the technology. Challenges are closely linked to the need for research and development as they can partly justify the assigned technology readiness level (TRL). Where is there room for improvement to speed up the R&D process and scale up the adoption of the technology? If possible, highlight the R&D priorities.	
Technology readiness level (TRL) (Optional)	
TRL should be assigned following the definitions found in the DSO/TSO Technopedia guidelines.	*TRL 6-9*
References (Optional)	

List of references.	*Url to relevant materials.*
Confidentiality declaration (Optional)	
By selecting "Yes", I state that I have read and understood the terms and conditions available here.	*Yes or No*

3.1.2 Data Set: Datasets for DSO/TSO Technology Use-Cases

Use case relevance (Mandatory)	
Is this a DSO or TSO Use case.	*DSO or TSO*
Brief description (Mandatory)	
Location and year of commissioning. Introduction and description of the technology application, objective, and how to reach the objective.	
Design (Mandatory)	
Technical configuration, country-specific relevant circumstances for the technology application, and difficulties/challenges with implementation.	
Results (Mandatory)	
Gains and advantages, consequences for existing work processes, and other operational impacts. Quantitative technical results shall be provided when feasible.	*Measured, calculated or estimated data related to the performance shall be included.*
Technology readiness level (TRL) (Mandatory)	
TRL should be assigned following the definitions found in the DSO/TSO Technopedia guidelines.	*TRL 6-9*
References (Mandatory)	
List of references.	*Url to relevant materials.*
Confidentiality declaration (Mandatory)	
By selecting "Yes", I state that I have read and understood the terms and conditions available here.	*Yes or No*

4 Allocation of Resources

To ensure accurate storage and processing of data collected during the DSO4DT project, the Project Manager (PM) will be responsible for managing all data within the dedicated DSO4DT platforms. Additionally, when data is ready for publication, the PM will oversee its timely and responsible upload to the appropriate dissemination platform. This long-term data management will be carried out using the designated platforms without incurring additional costs.

5 Data Security

Stakeholders providing data to the DSO4DT project are responsible for the storage, security, and recoverability of the data they generate. All data managed within the project will be protected according to its sensitivity level and in full compliance with applicable national and international regulations.

Before publication, all datasets will be reviewed to ensure that any sensitive information is excluded, ensuring responsible and compliant data sharing.

6 Ethical Aspects

The datasets defined in this report will pertain solely to technical data, not personal data. As such, no ethical concerns are expected to arise regarding the publication of these datasets as open data.

7 References

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