D1.2 – Data Management Plan

Submission date: 31st January 2023

Due date: 31st January 2023

DOCUMENT SUMMARY INFORMATION

Grant Agreement No	101082355	Acronym	RESPONDENT
Full Title	Renewable Energy Sources Power FOrecasting and SyNchronisation for Smart GriD NEtworks MaNagemenT		
Start Date	01/11/2022	**Duration**	30 months
Deliverable	D1.2: Data Management Plan		
Work Package	WP1 – Project Management & IPR Management		
Type	R	**Dissemination Level**	PU
Lead Beneficiary	CARR		
Authors	Benjamin Moore (CARR)		
Co-authors	Linda Henriksson (CARR), Fanourios Fakoukakis (FINT), Effie Makri (FINT), Dorleta García Melero (VICOM)		
Reviewers	Dorleta García Melero (VICOM), Fanourios Fakoukakis (FINT)		

The material presented and views expressed here are the responsibility of the author(s) only. The European Commission takes no responsibility for any use made of the information set out.

DOCUMENT HISTORY

Version	Date	Changes	Contributor(s)
V0.1	05/12/2022	Initial Deliverable Structure	Benjamin Moore (CARR) Linda Henriksson (CARR)
V0.2	06/01/2023	50% of the Deliverable Content	Benjamin Moore (CARR)
V0.3	17/01/2023	WP4 Datasets Inserted	Benjamin Moore (CARR)
V0.4	19/01/2023	Incorporation of reviewer feedback/comments	Benjamin Moore (CARR) Dorleta García Melero (VICOM)
V0.5	20/01/2023	WP5 Datasets Inserted	Benjamin Moore (CARR)
V0.6	23/01/2023	WP3 Datasets Inserted	Benjamin Moore (CARR)
V0.7	25/01/2023	Revisions to text	Benjamin Moore (CARR) Linda Henriksson (CARR)
V0.8	31/01/2023	Incorporation of reviewer feedback/comments	Benjamin Moore (CARR) Linda Henriksson (CARR) Dorleta García Melero (VICOM) Fanourios Fakoukakis (FINT)
V1.0	31/01/2023	Quality review check	Benjamin Moore (CARR) Linda Henriksson (CARR)

PROJECT PARTNERS

Partner	Country	Short name
FUTURE INTELLIGENCE EREVNA TILEPIKINONIAKON KE PLIROFORIAKON SYSTIMATON EPE	Greece	**FINT**
FUNDACION CENTRO DE TECNOLOGIAS DE INTERACCION VISUAL Y COMUNICACIONES VICOMTECH	Spain	**VICOM**
CARR COMMUNICATIONS LIMITED	Ireland	**CARR**
KIEFER TEK ETAIREIA PERIORISMENIS EFTHYNIS	Greece	**KIEFER**
GREENESCO ENERGEIAKI ANONYMI ETAIREIA	Greece	**GREEN**
ESTABANELL Y PAHISA ENERGIA SA	Spain	**EPESA**
FUNDACIO INSTITUT DE RECERCA DE L'ENERGIA DE CATALUNYA	Spain	**IREC-CERCA**
ELECTROTECNICA DEL URUMEA SL	Spain	**EUSKABEA**

LIST OF ACRONYMS

Acronym	Definition
AI	Artificial Intelligence
EO	Earth Observation
FAIR	Findable, Accessible, Interoperable and Re-usable
GA	Grant Agreement
GDPR	General Data Protection Regulation
GNS	Global Navigation System
LIA	Legitimate Interest Assessment
ML	Machine Learning
PMU	Phasor Measurement Unit
RES	Renewable Energy Sources
WP	Work Package

Executive Summary

This deliverable incorporates the RESPONDENT Data Management Plan (DMP), delivered as *D1.2 – Data Management Plan.* The purpose of the data management plan is to identify the scope for data management in the project, and then to consider in turn the datasets present within the project itself.

All partners of RESPONDENT's consortium will adhere to sound data management principles to ensure that the meaningful data collected, processed and/or generated throughout the duration of the project is well-managed, archived and preserved. Therefore, a comprehensive data management plan (DMP) is essential and must be delivered early in the project, fully describing the procedures for ensuring that the data management process complies with National (Greece, Ireland, and Spain) and EU Legislation.

In this document, the initial approach to data management within RESPONDENT has been presented by establishing the types of data likely to be encountered, the FAIR approach to data management, and how it is specifically applied within the project.

It is recognised, however, that responsible data management is a continual process that must be cognisant of any new datasets that may emerge throughout the lifecycle of the project. The Data Management Plan, therefore, can be updated should emerging data be recognised and/or uncovered during the course of the project's activities and disclosed during periodic reporting of the project's progress.

Table of Contents

LIST OF TABLES

1 Introduction

Renewable energy sources (RES), such as solar, wind, and hydropower, and their increased uptake will be crucial if Europe is to achieve its aspiration to transform to a climate-neutral economy. However, in order to fully utilise the power-generation capabilities of these resources, and to ensure that they can be effectively integrated and monitored throughout the bloc, issues pertaining to RES power generation forecasting, demand forecasting and smart power grid monitoring and supply/demand balancing must be addressed.

To this end, the EU-funded RESPONDENT project intends to develop and introduce an AI/ML RES power generation forecasting algorithm, exploiting both Copernicus EO and site-specific weather data, along with renewable energy power conversion models and an AI/ML – multiphysics model for power demand of certain communities. Lastly, RESPONDENT will build a Galileo-enabled PMU and develop a monitoring module, in order to test and verify the advantages offered from the Galileo timing and synchronization services in smart grid monitoring, power balancing and overall operation.

1.1 Purpose of the document

Given the scope and multi-faceted nature of the project, data will play a crucial role in all aspects of research, development, and evaluation in the RESPONDENT project throughout its lifecycle and beyond. This deliverable and the document itself are therefore focused on providing a clear overview of the established data management practices within RESPONDENT and compiling the initial list of datasets present (or expected to be) within the project. RESPONDENT will also take a FAIR approach to data management following the European Commission's guidelines. Combined, these two aspects comprise the overall RESPONDENT Data Management Plan.

1.2 Intended readership

RESPONDENT's Data Management Plan includes information about the types of data that have been identified by the consortium partners by M3, as well as how the data will be managed FAIR-ly and in-line with relevant EU legislation. It serves as an essential informative document, helping to increase visibility of pertinent data management practices as followed by the consortium members throughout the duration of the project and beyond.

In addition to members of the consortium, the Data Management Plan will also be of interest to external stakeholders and end-user beneficiaries of the RESPONDENT integrated solution who may wish to learn more about how relevant data is gathered, processed, stored, etc. As a public deliverable, the DMP will be accessible to anyone through the RESPONDENT website.

2 Legal Framework

The RESPONDENT approach to data management will be in full compliance with the EU legislative and regulatory framework, particularly as it relates to personal data and data protection provisions that may be encountered during future communication, dissemination, and stakeholder activities. This chapter summarises the main regulations and basic concepts of the EU legal framework that RESPONDENT will adhere to.

In addition, for any personal data external to the consortium partners that is gathered for the purposes of communication or dissemination of the project's work, such as through photos, videos, audio etc., a consent sheet will be provided, and can be viewed in Annex 1 of this document.

2.1 European Convention on Human Rights

The RESPONDENT project will fully adhere to the principles and spirit of the case law of the European Convention of Human Rights in the processing of any personal data that occurs during the project's lifecycle. The European Convention on Human Rights enshrines a non-autonomous right to data protection mainly through Article 8 right to respect for private and family life, which states:

1. Everyone has the right to respect for his private and family life, his home, and his correspondence.
2. There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety, or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others.

Additionally, the right to data protection also arises from Article 9 freedom of thought, conscience, and religion; Article 10 freedom of expression; Article 14 prohibition of discrimination; Article 1 of Protocol No. 1 right to peaceful enjoyment of possessions; and Article 2 Of Protocol No. 4 freedom of movement [2].

Following the relevant case law of the Court with respect to interferences with Article 8 rights, where personal data is processed it will be:

- Minimised only to what is legitimate and necessary in achieving the project's goals
- Kept accurate and up to date
- Retained for no longer than necessary to achieve the project's goals (including a five-year period after the project has ceased where such data is required for any audits initiated by the European Commission)
- Limited only to the purposes for which they were collected/processed
- Transparency of data processing procedures for access to personal data [2] [pp. 27-29]

Particular attention will be paid to the case law of the Court with regards to data collection by employers in the workplace. No arbitrary or covert surveillance or audio/visual recording of employees or their activities and communications (especially those unrelated to their work) will be undertaken during the course of the project, and consent will be obtained, as required, by employees in order to process their personal data [2] [pp.34-37].

Furthermore, understanding that case law of the Court has enshrined particular rights of data subjects, the RESPONDENT project will uphold these rights by:

- Providing data subjects access to their personal data
- Allowing them to amend or rectify any of their personal data
- Deleting their data upon their request, where possible [2] [pp. 57-63]

Such rights will be facilitated by the provision of contact details of data controllers where research data collection is taking place, to data subjects, and a central point of contact on the project's website.

2.2 Charter of Fundamental Rights of the European Union

The Charter of Fundamental Rights of the European Union specifically enshrines the right to data protection in Article 8 protection of personal data, which states:

1. Everyone has the right to the protection of personal data concerning him or her.
2. Such data must be processed fairly for specified purposes and on the basis of the consent of the person concerned or some other legitimate basis laid down by law. Everyone has the right of access to data which has been collected concerning him or her, and the right to have it rectified.
3. Compliance with these rules shall be subject to control by an independent authority

The relevant ends of data protection are similarly enshrined in Article 1 **human dignity** and Article 7 **right to private and family life**.

The RESPONDENT project will uphold these rights during data processing activities over the lifecycle of the project by adhering to the rules and principles of the General Data Protection Regulation, as well as by adhering to the principles and spirit of the case law of the European Convention on Human Rights.

2.3 General Data Protection Regulation (Regulation (EU) 2016/679 of 27 April 2016)

All RESPONDENT projects partners will adhere to the requirements of the General Data Protection Regulation while processing personal data.

Personal data is defined in the GDPR Article 4(1) as:

(1) 'personal data' means any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.

Whilst processing is defined in the GDPR Article 4(2) as:

'processing' means any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.

3 Data Summary

This section presents the summary of datasets that will be collected and generated during the project, and that the partners have identified at this stage (M3). Successful completion of the RESPONDENT project relies on the collection and exploitation of a diverse range of datasets for the successful implementation of the RESPONDENT integrated solution suite. Data management, and specifically research data management, within RESPONDENT will therefore follow the guidance provided by the European Commission in their Guidelines on FAIR data management. This approach is taken to ensure consistency in data management within RESPONDENT and to support maximum use and re-use of datasets through the implementation of appropriate data management practices.

As a project, RESPONDENT is committed to following best practices for overall data management and aligns itself within the guiding principle that data should be "as open as possible, as closed as necessary". The necessary security requirements imposed upon the project should motivate a high standard of data management practices to ensure that all data is appropriately recorded, documented, stored, and disposed of as necessary and in line with legal, ethical, data privacy, and security requirements.

As part of the process for collecting data likely to be used/encountered during the RESPONDENT project, an information sheet was distributed to all technical partners of the project. These partners were asked to carefully consider the answers to these questions regarding datasets that are currently known/anticipated as part of their respective work packages, and are presented in the following tables of this section under the headings of the appropriate work packages.

Once partners had considered the data that they are likely to use/encounter, they were also issued a list of questions that asked how the data they will use aligns with the FAIR principles, as well as further questions that included ethical considerations, data security, and allocation of resources. The questions and partner answers concerning the FAIR-ification of data can be found in **Section 4, FAIR Principles** of this document.

WP3 - RES Power Generation Forecasting

The objectives of WP3 as outlined in the Grant Agreement are as follows:

- To integrate and correlate the Copernicus data with the site-specific data from the IoT weather stations.
- To enhance the existing AI/ML algorithm for local weather forecasting using the correlated data.
- To determine the RES power conversion models based on the defined Use Cases.
- To produce the AI/ML algorithm for RES power generation forecasting.

The datasets identified so far (M3) for WP3 are listed below and described in greater detail in the accompanying table.

1. Weather Data:
- Copernicus and/or other sources satellite data (provided by VICOM)
    a) Raw

        b) Pre-/processed
        c) Real-time
        d) Near real-time
        e) Historical

- In-situ IoT weather station data (provided by FINT)
  - a) Real-time
  - b) Historical

- Forecasted (processed)

2. Power Output Data (provided by Kiefer):

- Real-time (raw and processed)

- Historical (raw and processed)

- Forecasted (processed)

Table 1: Overview of Datasets in WP3 – RES Power Generation Forecasting

	Purpose	Type and format	Is data re-used?	Origin of the data	Stated size (if known)
1	To create the weather forecasting algorithmic model	XML, GRIB, NetCDF, SENTINEL-SAFE, various binary formats	Yes, in the current project for the demand forecasting and in other projects	Copernicus and other satellite sources	GB, TB
2	To create the RES power forecasting algorithm and module	.CSV, .JSON, .XLSX, others	No	KIEFER	GB, TB

WP4 – Power Demand Forecasting

The objectives of WP4 as outlined in the Grant Agreement are as follows:

- To develop the AI/ML-multiphysics algorithm for power demand forecasting
- To integrate community power consumption data into the algorithm
- To produce simulation outputs for the demand forecasting

The datasets identified so far (M3) for WP4 are listed below and described in greater detail in the accompanying table.

1. Electrical data

2. Data about the organisation (size, staff, etc.)

3. Meteorological data (provided by Copernicus)

Table 2: Overview of Datasets in WP4 – Power Demand Forecasting

	Purpose	Format	Is data re-used?	Origin of the data	Stated size (if known)
1	To create the demand forecasting models	CSV	The data provided by EUS are used in other projects with them, although they are not public	EUSKABEA	TB
2	To create the response forecasting models	CSV	The data provided by EUS are used in other projects with them, although they are not public	EUSKABEA	TB
3	To create the demand forecasting models	CSV	Copernicus data is reused	GNS	TB

WP5 - Smart-Grid Galileo-based Synchronisation and Monitoring

The objectives of WP5 as outlined in the Grant Agreement are as follows:

- To determine the optimum location of PMUs in the smart energy grid, in accordance with the grid's current monitoring techniques
- To integrate the appropriate COTS Galileo receiver into 2 selected PMUs and micro-PMUs
- To develop the cloud-based T&S module for centralised monitoring of time-stamped PMU measurement signals

The datasets identified so far (M3) for WP5 are listed below and described in greater detail in the accompanying table.

1. Electrical data
2. Electrical grid models

3. Fragility curves from electrical components
4. Meteorological data (provided by Copernicus)

Table 3: Overview of Datasets in WP5 – Smart-Grid Galileo-based Synchronisation and Monitoring

	Purpose	Type and format	Is data re-used?	Origin of the data	Stated size (if known)
1	To represent the real grid and model it for further analysis	CSV; .XLS and other	The data provided by Estabanell is used in other projects with them, although they are not public	ESTABANELL (EPESA)	TB
2	To develop failure probability calculations depending on weather	Look-up tables	The data provided is developed by IREC, based on literature and previous experiences	OpenSource and IREC	GB
3	To create the weather forecasting and resilience platform	CSV	Copernicus data is reused	GNS	TB
4	Visualize in maps	SHP and KMZ	Location of components	OpenStreetMaps and private companies	GB

4 FAIR principles

FAIR Data

The principles of FAIR data management emerged in 2014[1] following the identification of the need to optimise the use of research data particularly with regards to supporting computational analysis. These principles were formulated by Wilkinson et al. [1] who defined the FAIR guiding principles for scientific data management and stewardship. These principles stated that data should be:

- Findable
- Accessible
- Interoperable
- Reusable

Wilkinson et al. were keen to stress that good data management is not intended to be a goal in and of itself, but as a means to support continued 'knowledge discovery and innovation'; an additional goal could also be considered to support scientific reproducibility and replicability. Furthermore, an important distinction emphasised in the OpenAIRE guide to FAIR data[2] is that data can undergo the FAIR-ification process without the final outcome being that the data (or even the metadata) should become openly accessible. Instead, it is by following the FAIR process appropriately that a well-defined and reasoned justification for these decisions can be documented.

The European Commission also advocates for the usage of FAIR principles for data management within its guidelines. Indeed, the European Commission has highlighted the importance of making the data produced by European-funded projects Findable, Accessible, Interoperable and Reusable, with a view to ensuring its sound management, as well as boosting the dissemination of relevant information and the easy exchange of data. Thus, the European FAIR data approach implements standards and metadata to make data discoverable, specifying data sharing procedures and which data will be open, allowing data exchange via open repositories as well as facilitating the reusability of the data.

4.1.1 Findable Data

Making data findable is the first core principle of the FAIR process. RESPONDENT emphasises the need to improve the discoverability of data produced/used during its activities.

Regardless of the openness of the data, findability encompasses addressing the following factors. The FAIR guidelines set out four principles for helping to ensure data is findable.

4.1.1.1 Metadata

Appropriate use of **metadata** both through the reuse of existing standards (such as FAIR sharing[3]) or clear processes when creating new metadata, such as the use of **standard identifiers** (e.g., DOIs). Following a

---

[1] https://www.force11.org/fairprinciples

[2] https://www.openaire.eu/how-to-make-your-data-fair

[3] https://fairsharing.org/

metadata-driven approach will improve the searchability of data, while at the same time supporting its interpretation and re-use both for humans and computers. To this end, project data can be identified with rich metadata relevant to its content and format and "machine-readable" to ensure automatic discovery of datasets and services. The project uses metadata that follow a globally unique and persistent identification mechanism for the development of rich and reliable metadata to promote the long-term discovery, usage, and integrity of its data.

RESPONDENT will be expected to deposit part of the generated and collected data in an open online research data repository, such as Zenodo.

4.1.1.2   Naming Conventions

For common **naming conventions**, these should be consistent across the RESPONDENT project, the quality domain, and standard practices of industrial partners, where possible. Standards for the research area should also be observed. For the identification of RESPONDENT research data files, it is recommended to use a descriptive name as this will reflect the contents of the file and not use an exaggerated number of characters, special characters, and/or spaces.

The attributes to include in the file naming convention for RESPONDENT research data are presented in the following example:

"RESPONDENT_Inventory_Data_v0.1.xls"

- A prefix to specify that it is RESPONDENT-related data ("RESPONDENT")
- An intuitive title ("Inventory Data")
- For each new version of the data, specify the respective number ("v0.1")
- The respective file format (".xls")

4.1.1.3   Keywords

Similar to the above, keywords should also be defined and standardised, particularly in the case of open data. The project's data will be provided with easy-to-use search keywords with a view to maximizing its re-use by interested stakeholders throughout the project's lifecycle. Keywords, as a subset of metadata, are therefore used to add valuable information to the data collected/generated facilitating its discoverability and correlation to the RESPONDENT project. In this regard, the project strategy on keywords is based on the following principles:

- The who, the what, the when, the where, and the why should be covered
- Consistency among the different keyword tags needs to be ensured
- Relevant, understandable, and explicit keywording should be followed

4.1.1.4   Versioning

Many datasets undergo changes as errors are amended or new data is included. It is therefore essential to implement **versioning** whenever a dataset is updated.

Versioning makes a revision of datasets uniquely identifiable, thus enabling the ability to keep track of the work done. More specifically, data versioning is used to define whether and how data changed over time, as well as to explicitly identify which version the creators / editors are working with.

In addition, effective data versioning makes it easier to understand whether an updated version of a dataset is available and which changes have been made between the different versions, allowing for comparisons and avoiding confusion. In this context, a clear version number indicator is used in the naming convention of every data file produced during RESPONDENT to facilitate the identification of different versions.

4.1.2 Accessible Data

Making data accessible is the second core principle of the FAIR process. There are broadly three main options when considering accessibility:

1. The data is not made available; however, a full justification should be included in the DMP and whether this applies only to external parties or also to members of the consortium. Reasons for non-availability may include legal, contractual, security, data privacy or intellectual property concerns.
2. The data is potentially available but is subject to a range of restrictions including but not limited to, who can use and access the data; how the data is accessed, the authorisations required; or how the data can be used.
3. The data is openly available on a research data repository and accompanied by comprehensive metadata and methodology of collection.

Should the decision be made that the data can be made available, there are several further points that should be considered to support the process:

- Where will the data be accessible from? (e.g., in a repository and which one?)
- Is there additional information that should be deposited with the data including the metadata, a codebook, software, or source code?
- Does an authorisation process need to be in place for access and who manages this process? Is this process clear and transparent? Is it combined with an appropriate licence?

To maximize the impact of the RESPONDENT project, research data will be shared within and beyond the Consortium. Selected data and results will be shared with the scientific community and other stakeholders through publications in scientific journals and presentations at conferences, as well as through open access data repositories.

In RESPONDENT, data available will be made findable and accessible by providing a common repository, such as Zenodo, for storing the data.

Public deliverables listed in the GA will be made publicly available via the project website. All personal and sensitive information will be removed from these datasets/reports before they are made public.

4.1.2.1   Research Data and Open Access

In RESPONDENT, as included in the Grant Agreement, the partners agreed that the Data Management Plan would be realised in accordance with the Guidelines on Open Access to Scientific Publications and Research Data.

Research publications will be made available for free access for everyone including the rights to read, make download, print and right to copy, distribute, search, link, trace and extract. Open Access does not imply an obligation to publish results since this decision is entirely the responsibility of the partners and does not also affect the decision to commercially exploit the results. Open access can only become a problem if the

publication is chosen as the means of dissemination. The decision to publish (or not) through open access should only come after a more general decision on whether to publish directly or to first seek IP protection.

4.1.3   Interoperable Data

Interoperability is the third core principle of the FAIR process. Datasets are often at their most valuable when combined with other data and facilitated by the interoperability process. Interoperability can be supported through:

- the use of standardised formats, compliance with existing standards, usage of common ontologies
- the use of common metadata within the project

It is essential that published datasets are unequivocally interpretable by third persons without any link to the project. Therefore, each dataset needs to be accompanied with a description of the methodology, sources, definitions, and scope of the data contained in it. Whenever possible, datasets should be structured in such a way that it can, in full or in part, be combined with another dataset, from the project or any other data source.

RESPONDENT will adopt in its data management methodology the use of metadata vocabularies, standards, and methods that will increase the interoperability of the data collected/generated through its activities. More specifically, standard vocabularies will be used for all data types present in the project. In case there is an uncommon vocabulary, a clear mapping will be provided to facilitate its use. Thus, the project's data will be interoperable and easy for sharing among researchers, institutions, and organisations.

4.1.4   Reusable Data

Reusability is the final core principle of the FAIR process. The promotion of reusability is important particularly when data is being made available to other researchers as the need to both understand the context in which the data was collected and any relevant limitations to the dataset, as well as in which circumstances reuse is permitted.

Reusability is focused, on the one hand, on the application of appropriate licences. On the other hand, it should also consider the timescales from collection to publication, the effect of any embargoes, or if there is a 'shelf-life' to the applicability of the data.

Other factors affecting reusability include to whom the data itself may be useful (e.g., data collected for use by a specific module, as part of a particular use case, or for a single end user that may not transfer to other uses). Documentation accompanying the dataset submission may set out how data should (not) be interpreted to avoid misunderstandings.

The RESPONDENT project is expected to produce a substantial volume of data and knowledge that will be presented to interested stakeholders, as well as society at large, through carefully considered dissemination actions and activities. Datasets produced as a result of the project work will be shared within the Consortium and will only be allowed for external sharing with a consensual Consortium approval of the relevant stakeholders, by accepting the terms and conditions of use, as appropriate. The license for the access, sharing and re-use of RESPONDENT material and output datasets will be defined by the Consortium on a case by-case basis.

Finally, before any RESPONDENT data is made available, **quality and security assurances** should be in place to both ensure that the dataset is free from errors, is appropriately documented, and does not raise any security concerns.

5 FAIR Data in RESPONDENT

As mentioned in the Data Summary section of this deliverable, the following questions were distributed among the partners and asked how the data they will use aligns with the FAIR principles, as well as further questions that included ethical considerations, data security, and allocation of resources.

These questions and answers can be found under the following headings and are listed by work package.

WP3 – RES Power Generation Forecasting

In general terms, your research data should be Findable, Accessible, Interoperable and Re-usable. Answer to the points below as necessary.

- **Question:** _Findable data: Outline discoverability of data: What metadata will be provided to help others identify and discover the data? How will you capture this information and where will it be recorded?_
- **Answer:** Some data can be made public if required, since it is already based on open sources. Regarding proprietary data, we are still unable to publish this, but anonymized and synthetic data based on this may be transferred. If data were to be published, it would be identifiable by means of rich metadata, as well as using standard identification mechanisms, such as Digital Object Identifiers.

- **Question:** _Accessible data: What data will be made openly available? If some data is kept closed, please provide the rationale for doing so. How will the data be made available? Are specific tools necessary to access the data? Are there restrictions to access the data?_
- **Answer:** If data were to be published, it may be used in scientific papers, as well as stored in public repositories such as Zenodo. Although we will try to have as much of the data open as possible, the origin of the data is that of private companies' and their electrical power generation, and so their permission is needed to publish.

- **Question:** _Interoperable data: assess the interoperability of your data. What data and metadata vocabularies, standards or methodologies will you follow? Is any standard vocabulary present in the dataset?_
- **Answer:** N/A

- **Question:** _Re-usable data: how will the data be licenced? When will it be made available? Can it be used by third parties? Is there any data quality assurance? How long will the data be re-usable?_
- **Answer**: If data were to be published, the most suitable licence will be considered, including a Creative Commons licence.

- **Question:** _Allocation of resources: What are the estimated costs of making the data Findable, Accessible, Interoperable and Re-usable? Who is the responsible person for data management?_
- **Answer:** The costs of publishing in open access.

- **Question:** _Data security: address data recovery, secure storage and transfer of sensitive data if needed. Is it safely stored in certified repositories?_

- **Answer**: All data stored in AWS servers is automatically backed up. At FINT, the data is stored on a cyber secure private cloud platform.

- **Question:** *Ethical aspects: are there any ethical aspects to bear in mind in relation with the data?*
- **Answer**: No.

- **Question:** *Are there any national/funder/sectorial/departmental procedure for data management that you are using?*
- **Answer**: N/A

WP4 – Power Demand Forecasting

In general terms, your research data should be Findable, Accessible, Interoperable and Re-usable. Answer to the points below as necessary.

- **Question:** *Findable data: Outline discoverability of data: What metadata will be provided to help others identify and discover the data? How will you capture this information and where will it be recorded?*
- **Answer:** At this stage, questions remain as to whether we will be able to publish the data since it will be provided by private companies. If data is to be published, it will be identifiable by means of rich metadata, as well as using standard identification mechanisms, such as Digital Object Identifiers.

- **Question:** *Accessible data: What data will be made openly available? If some data is kept closed, please provide the rationale for doing so. How will the data be made available? Are specific tools necessary to access the data? Are there restrictions to access the data?*
- **Answer:** If data were to be published, it may be used in scientific papers, as well as stored in public repositories such as Zenodo. Although we will endeavour to keep as much data as open as possible, the origin of the data is that of private companies and their electrical consumption, and so their permission is needed to publish.

- **Question:** *Interoperable data: assess the interoperability of your data. What data and metadata vocabularies, standards or methodologies will you follow? Is any standard vocabulary present in the dataset?*
- **Answer:** N/A

- **Question:** *Re-usable data: how will the data be licenced? When will it be made available? Can it be used by third parties? Is there any data quality assurance? How long will the data be re-usable?*
- **Answer**: If data were to be published, the most suitable licence will be considered, including a Creative Commons licence.

- **Question:** *Allocation of resources: What are the estimated costs of making the data Findable, Accessible, Interoperable and Re-usable? Who is the responsible person for data management?*
- **Answer:** The costs of publishing in open access.

- **Question:** *Data security: address data recovery, secure storage and transfer of sensitive data if needed. Is it safely stored in certified repositories?*

- **Answer**: All data stored in AWS servers is automatically backed up. At Vicomtech, backups of all the data are performed regularly and, for increased security, data is also stored on a secure private cloud.

- **Question:** *Ethical aspects: are there any ethical aspects to bear in mind in relation with the data?*
- **Answer**: As aforementioned, all the data we are going to gather is confidential, and therefore the owner's permission will be sought prior to any publication of the information.

- **Question:** *Are there any national/funder/sectorial/departmental procedure for data management that you are using?*
- **Answer**: N/A

WP5 - Smart-Grid Galileo-based Synchronisation and Monitoring

In general terms, your research data should be Findable, Accessible, Interoperable and Re-usable. Answer to the points below as necessary.

- **Question:** *Findable data: Outline discoverability of data: What metadata will be provided to help others identify and discover the data? How will you capture this information and where will it be recorded?*
- **Answer:** Some data can be made public if required, since it is already based on open sources. Regarding proprietary data, we are still unable to publish this, but anonymized and synthetic data based on this may be transferred. If data were to be published, it would be identifiable by means of rich metadata, as well as using standard identification mechanisms, such as Digital Object Identifiers.

- **Question:** *Accessible data: What data will be made openly available? If some data is kept closed, please provide the rationale for doing so. How will the data be made available? Are specific tools necessary to access the data? Are there restrictions to access the data?*
- **Answer:** If data were to be published, it may be used in scientific papers, as well as stored in public repositories such as Zenodo. Although we will try to have as much of the data open as possible, there is data which is considered critical, such as the electrical grid network and components. As they pertain to critical infrastructure, they cannot be openly shared.

- **Question:** *Interoperable data: assess the interoperability of your data. What data and metadata vocabularies, standards or methodologies will you follow? Is any standard vocabulary present in the dataset?*
- **Answer:** For metadata, we will follow the standards selected by the consortium.

- **Question:** *Re-usable data: how will the data be licenced? When will it be made available? Can it be used by third parties? Is there any data quality assurance? How long will the data be re-usable?*
- **Answer**: If data were to be published, the most suitable licence will be considered, including a Creative Commons licence.

- **Question:** *Allocation of resources: What are the estimated costs of making the data Findable, Accessible, Interoperable and Re-usable? Who is the responsible person for data management?*
- **Answer:** The costs of publishing in open access, as well as some personal effort on the uploading and updating of the data too.

- **Question:** *Data security: address data recovery, secure storage and transfer of sensitive data if needed. Is it safely stored in certified repositories?*
- **Answer**: All data is internally stored in IREC servers for backup (including a cloud version).

- **Question:** *Ethical aspects: are there any ethical aspects to bear in mind in relation with the data?*
- **Answer**: As aforementioned, some data is critical and may therefore be restricted, and so it must be treated carefully. It is worth noting that in IREC we have Certification from the Spanish Ministry of Defense to handle such security level data (EU restricted).

- **Question:** *Are there any national/funder/sectorial/departmental procedure for data management that you are using?*
- **Answer**: N/A

6 Conclusions

This deliverable has set out the principles for data management within the RESPONDENT project. The data within RESPONDENT is expected to adhere to the FAIR principles and the ways in which data will be made findable, accessible, interoperable, and reusable have been detailed within this report.

Each work package has been analysed for data processing activities and relevant datasets have been identified, with additional questions asked and answered about how such data will align with FAIR principles.

References

[1] Wilkinson, M. D. et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. Scientific data, 3(1), 1-9

[2] Council of Europe/European Court of Human Rights. (2021). Guide to the Case-Law of the of the European Court of Human Rights: Data Protection. Strasbourg: Council of Europe/European Court of Human Rights. Available at: https://rm.coe.int/guide-dataprotection-eng-1-2789-7576-0899-v-1/1680a20af0

[3] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation). Available at: https://eur-lex.europa.eu/eli/reg/2016/679/oj

Annexes

Annex I: Consent Sheet Template

Name of event:

Date of event:

No	Name	Signature	Organisation	Photo/video/audio consent* (Please tick ✓)

*Consent for photography/audio/video

I agree for my name and photo, video footage, or audio to be taken for use in dissemination activities in connection with the RESPONDENT project.

Here are some places RESPONDENT might use the photos/audio/footage: project website, Twitter, LinkedIn (page and group), YouTube and Newsletter.

Your information will be processed and stored in line with the RESPONDENT data management process and the GDPR.

You can change your mind and withdraw consent for us to process your photograph, audio, or video at any time by contacting bmoore@carrcommunications.ie and linda@carrcommunications.ie.

Your participation is entirely voluntary and there is no obligation on you to give your consent to have your voice or image captured.