IANOS

SUSTAINABLE SOLUTIONS
for islands' decarbonisation

Data Management Plan v3

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			GDPR
1.0	31/03/2023	ENG, NEC	Final version after internal review

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Executive Summary

This document presents the third version of IANOS Data Management Plan as part of Deliverable D1.15, developed under task T1.4 – Data, Ethics and Cyber Security Management of Work Package 1 – Project Management. The aim of this deliverable is to provide an update with the latest information available on the management of data collected, processed and/or generated during the course of the project.

The approach taken for this document referred to the Guidelines on FAIR Data Management in Horizon 2020: scientific research relies on advancements and improvements in earlier works made public, and FAIR [1] data principles make it possible the scientific dialogue by ensuring that data are Findable, Accessible, Interoperable, and Reusable. The guidelines were used as a reference to define a dataset identification template and a list of questions that were circulated among the project partners to collect the necessary information.

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Notations, abbreviations, and acronyms

Table 1 Acronym's list

AES	Advanced Encryption Standard
AMI	Advanced Metering Infrastructure
API	Application Programming interface
BMS	Building Management System
dEF-Pi	distributed Energy Flexibility Platform and interface
EMS	Energy Management System
ESB	Enterprise Service Bus
ESDL	Energy System Description Language
ESSIM	Energy System SIMulator
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FI	Fellow Island
HEMS	Home Energy Management System
IaaS	Infra-structure as a Service
IoT	Internet of Things
iVPP	intelligent Virtual Power Plant
LCA	Life Cycle Assessment
LCC	Life Cycle Cost
LH	LightHouse island
RES	Renewable Energy Source
SIEM	Security Information Event Management
SOC	Security Operations Center
SoC	State of Charge
VDC	Virtual Data Centre

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1 Introduction

1.1 Objectives and Scope

This deliverable presents the second update of the Data Management Plan for the IANOS project. The Data Management Plan explains how the different datasets of the IANOS project are stored and shared with third parties. The datasets are assembled and constructed in order to fulfil the project goals. Specific attention is given to the management of sensitive data in compliance with GDPR [2] in order to safeguard consumers' privacy and to increase the full societal acceptance of the IANOS solution by local energy consumers.

This document was created following the guidelines specified by the EC in "H2020 Programme Guidelines on FAIR Data Management in Horizon 2020 (V3.0- 26 July 2016) [1]" along with "ANNEX 1- Horizon 2020 FAIR DMP template". A questionnaire has been sent to all project partners to answer the questions in the Horizon 2020 FAIR DMP template.

The Data Management Plan is a living document, which means that updated versions will be created as part of the progress being made in the project. An updated and final version of this document is already planned for M42 (the end of the project). This version reflects the status based on the information currently available in the project.

1.2 Relation to other activities

T1.4 and its deliverables provide guidelines to aggregate, maintain, and further distribute collected data for external usage. This document is linked to overall activities within IANOS as it describes how the data will be managed and stored throughout the project.

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1.3 Structure of the deliverable

Deliverable D1.15 is structured as follows:

- Chapter 1: Introduction reports the objectives and scope of the deliverable, its relation with other activities and the structure of the document
- Chapter 2: IANOS Datasets reports the list of identified datasets collected or generated within IANOS project. For each dataset information on purpose of data, types and formats, security and privacy considerations, origin, expected size, access policy, the reference person and other metadata information is provided.
- Chapter 3: Findable, Accessible, Interoperable, and Reusable (FAIR) data management, describes how the FAIR principles are applied to the project.
- Chapter 4: Data Privacy and Management of Personal Data summarises the most important principles applicable when processing data and explains how personal data is processed. A subsection is specifically dedicated to blockchain, a technology used within the IANOS architecture, and GDPR compliance.

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2 IANOS Datasets

The datasets listed below have been identified in the IANOS project and will be described in more detail in the following subchapters. Each dataset is represented by a table containing information on purpose of data collection/generation and its relation to the objectives of the project, what types and formats of data are generated/collected, security and privacy considerations, what is the origin of the data, what is the expected size of the data, and what will be the access policies for the data. The list of datasets identified for IANOS project includes:

1. iVPP flexibility data
2. iVPP market data
3. Integration between Centralized Dispatcher and P2P market data
4. Data used by ESSIM simulation platform
5. Data used by dEF-PI system
6. Data used by LCA/LCC (VERIFY) platform
7. Data used by Flywheel system
8. Data used by INTEMA system
9. Hybrid distribution transformed data
10. Data used by the P2P market
11. Stakeholder list and newsletter subscriber list
12. Smart Energy Router monitoring data
13. IANOS Secured Enterprise Service Bus (ESB)
14. Lighthouse Island and Fellow Island telemetry, forecast and optimization data
15. TidalKite system data

Compared to the previous version of the Data Management Plan, each dataset is updated and enriched with more accurate information reflecting the current status of project activities.

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2.1 iVPP flexibility data

Table 2 iVPP flexibility data

Dataset Name	iVPP flexibility data
Description	The iVPP requires flexibility information of all assets it has in its portfolio. This flexibility information is used to create an optimal plan for the VPP. This is real-time information, based on IoT devices data and state information of the asset that is managed.
Security & Privacy considerations	Flexibility information is privacy sensitive and needs to be appropriately secured for both communication and storage of this information. Data that has entered the platform will only be used by the platform itself and does not need to be shared with other parties.
Contact Person	Ewoud Werkman (TNO)
Datatype Name	prEN 50491-12-2 standard
Description	Until now TNO has used the S2 interface defined in EN 50491-12-1 and preliminary standard prEN 50491-12-2 to connect to devices using the dEF-pi platform provided by NEROA. TNO has created an implementation of this preliminary standard. Outputs: Market bids towards the markets and control instructions towards the managed Assets (by using the S2 interface). The following data is persisted in the platform per aggregation level (device, congestion point, cluster): • Planned energy (plan created by the iVPP) • Baseline energy (if available) • Measurements (measured or derived/forecasted)

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Purpose	Optimize the flexibility of the available portfolio for multiple energy markets/ services simultaneously.
Relevant Architectural component	ReFlex (Centralized Dispatcher implementation at Ameland) connected to dEF-Pi.
Format	JSON/OpenAPI/RAML schema definitions
Expected size	Not known
Origin	Devices connected through dEF-Pi
Access	iVPP users
Recipients	TNO ReFlex
Info about Metadata	S2 data consists of different types of information per device: • System description that describes the device capabilities and constraints. • Measurements data from smart meters or consumption or production of devices. • Information about the flexibility of the device • Forecast information of the device usage. • Timestamp at which moment in time the information was generated.

2.2 iVPP market data

Table 3 iVPP market data

Dataset Name	iVPP market data
Description	The iVPP requires market data when acting on energy markets. This can be information from an aggregator or data directly received from the market, e.g. GOPACS.
Security & Privacy considerations	Market data can be commercial sensitive information. Therefore, securing this data is required. Data that enters

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	the platform will only be used by the platform itself and does not need to be shared with other parties.
Contact Person	Ewoud Werkman (TNO)
Datatype Name	Cluster Target profile
Description	The cluster target profile describes the behaviour of the iVPP cluster for upcoming period. This profile is provided by the Aggregator.
Purpose	Exchange market information
Relevant Architectural component	Centralized Dispatcher (ReFlex in Ameland use case) and Aggregator (Repowered in Ameland use case)
Format	JSON, target profile of the iVPP
Expected size	Small
Origin	Aggregator or Market
Access	iVPP users, Aggregator
Recipients	Centralized Dispatcher (ReFlex)
Info about Metadata	-

2.3 Integration between Centralized Dispatcher and P2P market data

Table 4 Integration between Centralized Dispatcher and P2P market

Dataset Name	Integration between Centralized Dispatcher and P2P market data
Description	The integration with the P2P task requires specific data to be shared with the ESB. This information contains the device plans generated by the Centralized Dispatcher.

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Security & Privacy considerations	This data is privacy sensitive as it contains the planned behavior of devices in the use case and is shared with trusted third parties (P2P platform of Engineering).
Contact Person	Ewoud Werkman (TNO)
Datatype Name	Device plan
Description	The device plan describes the planned behaviour of an asset. This information can be used by the P2P platform to calculate the administrative energy exchanges using P2P.
Purpose	Facilitate P2P market
Relevant Architectural component	Centralized Dispatcher (ReFlex in Ameland use case), ESB and P2P market
Format	Timeseries
Expected size	Not known
Origin	Centralized Dispatcher
Access	iVPP users, P2P platform
Recipients	ESB and subsequently P2P market
Info about Metadata	-

2.4 Data used by ESSIM simulation platform

Table 5 ESSIM simulation data

Dataset Name	Data used by ESSIM simulation platform
Description	ESSIM is an ESDL (Energy System Description Language) based energy system simulator used to quantify specific KPI's of energy systems of any size, including marginal pricing based optimized energy flows.
Security & Privacy considerations	Some technical data could be restricted on the energy grid (ie. Transport and Transformers); usage of hourly data if

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	collected from real measurements should be anonymised and be made non traceable.
Contact Person	richard.westerga@tno.nl
Datatype Name	Simulation for energy system
Description	Energy system related data for the physical energy system: asset data describing its dimensioning and characteristics (i.e. production, storage, conversion, consumption and transport assets), hourly profiles, weather data (solar, wind, temperatures).
Purpose	Provide a simulation of grid balancing and its effects in an interconnected hybrid energy system over a period of time. It takes as inputs the energy system defined in ESDL and calculates optimal schedule of flexible producers and the effect of this schedule in terms of emissions, costs, load on the network, etc.
Relevant Architectural component	Simulation platform
Format	Energy system description in ESDL (XML based)
Expected size	TBD
Origin	Asset data
Access	Consortium Partners
Recipients	Project partners
Info about Metadata	Dataset contains info on all relevant assets in the energy system. Production and storage dates and places could vary per asset. Documentation on the format is available via ESDL Documentation - ESDL (gitbook.io)

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2.5 Data used by dEF-Pi system

Table 6 dEF-Pi system data

Dataset Name	dEF-Pi system data
Description	The dEF-Pi system targets the technical aggregator role. It is a platform that unlocks and controls energy flexibility from smart devices (e.g. heat pumps, EV, PV, batteries, etc.) and describes that energy flexibility in a generic way using appropriate interfaces.
Security & Privacy considerations	All data will flow through this system, so it has to be secure. It can lift on the privacy statement etc. from other parts of the projects, as this system is usually the backend of someone else's interface.
Contact Person	Jeroen Jansen, jeroen.jansen@neroa.nl
Datatype Name	Generic dEF-Pi telemetry data
Description	The data that the system needs to run itself.
Purpose	Check whether connections made with pilot-sites are made correctly.
Relevant Architectural component	The DefPi system relates to ReFlex on the one hand, and on the other hand to all energy assets on Ameland.
Format	TBD
Expected size	Relatively small (couple of GB)
Origin	The system itself
Access	Stays within the system
Recipients	Neroa
Info about Metadata	This data will not create any metadata.
Datatype Name	Generic user data
Description	Smart meter data and other IoT data.

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Purpose	To facilitate the measurements of the IANOS KPI's.
Relevant Architectural component	The DefPi system relates to ReFlex on the one hand, and on the other hand to all energy assets on Ameland.
Format	TBD
Expected size	Large (hundreds of GB)
Origin	User's device
Access	Project partners
Recipients	Users themselves, and IANOS project partners
Info about Metadata	-

2.6 Data used by LCA/LCC (VERIFIY) platform

Table 7 CERTH LCA/LCC (VERIFY) platform

Dataset Name	CERTH LCA/LCC (VERIFY) platform
Description	Output data related to Environmental and associated Economic KPIs using as Input i) Prosumers' smart meter, ii) data produced by IoT devices in relation with mainly the following categories: • IANOS Electrical Systems • IANOS Thermal Systems • IANOS Storage (electricity, heating/cooling) Systems
Security & Privacy considerations	Consideration of privacy for injected (input) and calculated (output) data related to the energy production/consumption of specific systems on a building / district level, since they may reveal the activity and the users' behaviour.

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	Consideration of the systems location, as they may provide important information for the owner and his economic status. Hence, the IANOS LCA/LCC platform entitled as "VERIFY" will assure that owed to afore-mentioned considerations, encoded data transactions and firewall utilization for the data base protection, will be applied. Access to the data will be monitored and controlled. The data will be stored in encrypted form, under Advanced Encryption Standard (AES) on the CERTH's related Data Lake. Firewall will prevent unauthorized malicious access, by separating the public and internal network. Furthermore, only certain people will be authorized to have access in the platform.
Contact Person	Nikolaos Nikolopoulos (n.nikolopoulos@certh.gr)
Datatype Name	IANOS Electrical Systems
Description	Generated data that report back the associated Environmental and associated Economic KPIs from the energy production/consumption of the various electrical components (e.g. PV, Wind Turbines, Flywheel, EVs (V2G), geothermal plant, waste incineration plant, Fuel Cells, Tidal Kite, Digester …) of the power system along with their location.
Purpose	Data will be used for calculating the environmental impact (e.g. CO2 emissions) and the economic performance.
Relevant Architectural component	VERIFY
Format	*.json, *.xml, *.csv
Expected size	multiple Mb/s (worst case scenario)

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Origin	i) Prosumers' smart meter, ii) IoT devices provided by the operators/vendors of both a) the IANOS innovative Electrical systems and b) own funded ones.
Access	Data will be openly available upon request, given that there are no restrictions/limitations (GDPR, IP) from the data sources side. Moreover, any necessary data related provision access rights will be respected, according to the GDPR and CA. Data will be made accessible through CERTH' s Data Lake. Data streams will be formulated according to a standard ontology (i.e., SAREF, Bricks Schema) with custom extensions. After access has been granted to external users, a "download by dataset" option from the API would allow specific data version to be retrieved.
Recipients	Project partners
Info about Metadata	A plan to permit rendering the data identifiable during the project, will be developed. For the naming convention, a syntactically correct variable naming formulation, dependent on source code implementation needs, will be applied.
Datatype Name	IANOS Thermal Systems
Description	Generated data that report back the associated Environmental and associated Economic KPIs from the various thermal components (e.g. PCM, Heat Pumps, electric water heaters, FCs for the part of any waste heat produced …) of the power system along with their location.
Purpose	Data will be used for calculating the environmental impact (e.g. CO2 emissions) and the economic performance.

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Relevant Architectural component	VERIFY
Format	*.json, *.xml, *.csv
Expected size	multiple Mb/s (worst case scenario)
Origin	i) Prosumers' smart meter, ii) IoT devices provided by the operators/vendors of both a) the IANOS innovative Electrical systems and b) own funded ones.
Access	Data will be openly available upon request, given that there are no restrictions/limitations (GDPR, IP) from the data sources side. Moreover, any necessary data related provision access rights will be respected, according to the GDPR and CA. Data will be made accessible through the CERTH' s Data Lake. Data streams will be formulated according to a standard ontology (i.e., SAREF, Bricks Schema) with custom extensions. After access has been granted to external users, a "download by dataset" option from the API would allow specific data version to be retrieved.
Recipients	Project partners
Info about Metadata	A plan to permit rendering the data identifiable during the project, will be developed. For the naming convention, a syntactically correct variable naming formulation, dependent on source code implementation needs, will be applied.
Datatype Name	IANOS Storage Systems
Description	Generated data that report back the associated Environmental and associated Economic KPIs from the various thermal components (e.g. electrochemical BESS

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	(centralized or distributed), Flywheel, biobased battery, electrolyzer …) of the power system along with their location.
Purpose	Data will be used for calculating the environmental impact (e.g. CO2 emissions) and the economic performance.
Relevant Architectural component	VERIFY
Format	*.json, *.xml, *.csv
Expected size	multiple Mb/s (worst case scenario)
Origin	i) Prosumers' smart meter, ii) IoT devices provided by the operators/vendors of both a) the IANOS innovative Electrical systems and b) own funded ones.
Access	Data will be openly available upon request, given that there are no restrictions/limitations (GDPR, IP) from the data sources side. Moreover, any necessary data related provision access rights will be respected, according to the GDPR and CA. Data will be made accessible through the CERTH' s Data Lake. Data streams will be formulated according to a standard ontology (i.e., SAREF, Bricks Schema) with custom extensions. After access has been granted to external users, a "download by dataset" option from the API would allow specific data version to be retrieved.
Recipients	Project partners
Info about Metadata	A plan to permit rendering the data identifiable during the project, will be developed. For the naming convention, a syntactically correct variable naming formulation,

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	dependent on source code implementation needs, will be applied.

2.7 Data used by Flywheel system

Table 8 Flywheel utilization data

Dataset Name	Flywheel utilization data
Description	Teraloop's flywheel power management load profile
Security & Privacy considerations	To be kept confidential, disclosure to be discussed with Teraloop and end user.
Contact Person	philippe.pepin@teraloop.com
Datatype Name	Load Profile in kW
Description	Profile of electricity consumption of end user, profile of grid electricity power fluctuation and activation of Teraloop device.
Purpose	Load profile forecast for the integration of a Teraloop device in the Terceira electricity grid at the end user location, to provide power management and fault ride through services.
Relevant Architectural component	Used by the iVPP platform
Format	Excel
Expected size	MB's
Origin	Teraloop's flywheel
Access	Terceira LH
Recipients	iVPP platform
Info about Metadata	NA

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2.8 Data used by INTEMA system

Table 9 Data used by Intema system

Dataset Name	"INTEMA_res": CERTH energy analysis (INTEMA.grid) platform. Input data for the platform include main grid assets parameters and design points, their topology, and the corresponding loads. The platform outputs data and expected performance data concern grid operation (multi-vector power flows) and can be utilized for the calculation of energy-related KPIs.
Description	The calculated energy-related data can support the calculation/estimation of KPIs, indicatively including: • production of conventional generation units (steam, gas, diesel, etc.) • production of RES generation units (PV, wind turbines, etc.) • energy exchange with the grid, including the storage assets (batteries, heating batteries, pumped hydro storage, etc.) • aggregated values for the performance assessment of the grid
Security & Privacy considerations	The INTEMA's related platform data are stored in CERTH's specialized Data Lake, which ensures protection via a set of integrated measures: • The data are stored and retrieved under encrypted form, through Advanced Encryption Standard (AES) protocol. • A firewall prevents unauthorized malicious access, by separating the public and internal network.

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	• Furthermore, only certain people will be authorized to have access to INTEMA.grid platform and related data. • INTEMA utilizes mainly static/historical data for its simulations; thus there is no need for any real-time connection, minimizing the risks for any security issues.
Contact Person	n.nikolopoulos@certh.gr
Datatype Name	Simulated data
Description	Post-processed data that include the main outcomes of the simulated scenario.
Purpose	Data will be utilized for the evaluation of energy KPIs.
Format	*.json
Expected size	several MB
Origin/ Source (e.g. which type of device)	Simulated data
Relevant Architectural component	INTEMA.grid
Access	Data will be made accessible through CERTH's Data Lake. Data streams will be formulated according to a standard ontology (i.e., SAREF, Bricks Schema) with custom extensions. After access has been granted to external users, the data can be queried based on specific input field selection.
Recipients	Project partners
Info about Metadata	Metadata will include the case information (name, location, date), the timestamp of the simulation.

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2.9 Hybrid distribution transformed data

Table 10 Hybrid distribution transformer data

Dataset Name	Hybrid distribution transformer data
Description	Data from the monitoring system installed in the hybrid transformer.
Security & Privacy considerations	Data is owned by the customer, then used by Efacec to assess the condition of the asset.
Contact Person	Andrea Soto <andrea.soto@efacec.com>
Datatype Name	Temperatures RTD PT100
Description	Ambient, top, and bottom oil temperatures.
Purpose	Measure temperatures indicating transformer failure modes.
Relevant Architectural component	Hybrid distribution transformer.
Format	Float
Expected size	12 bytes (3x 4 bytes)
Origin	PT100
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Float with two decimal places. Temperature expressed in °C (Celsius degree).
Datatype Name	Low Voltage side currents
Description	Low Voltage side currents.
Purpose	Measure transformer currents for load indicator currents.
Relevant Architectural component	Hybrid distribution transformer.

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Format	Float
Expected size	12 bytes (3x 4 bytes)
Origin	Rogowski coil sensor
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Float with two decimal places. Current expressed in A (Ampere).
Datatype Name	Moisture in oil
Description	Moisture in oil
Purpose	Measure the moisture dissolved in the transformer oil.
Relevant Architectural component	Hybrid distribution transformer.
Format	Float
Expected size	4 bytes
Origin	Moisture in oil sensor
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Float with one decimal place. Moisture in oil expressed in ppm (parts per million).
Datatype Name	Accelerometer
Description	Vibration in transformer
Purpose	Measure transformer vibration to detect patterns associated with known failure modes.
Relevant Architectural component	Hybrid distribution transformer.
Format	Integer
Expected size	4 bytest

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Origin	Vibration sensor
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Integer with one decimal place. Transformer vibration amplitude expressed as acceleration (mG).
Datatype Name	Noise
Description	Noise in transformer
Purpose	Measure the noise in the transformer surroundings to detect patterns associated with known failure modes.
Relevant Architectural component	Hybrid distribution transformer.
Format	Integer
Expected size	4 bytes
Origin	Vibration sensor
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Integer with one decimal place. Noise expressed in dB (decibels).
Datatype Name	Pressure in-tank
Description	in-tank pressure measured in three spots.
Purpose	Measure in-tank pressure indicating failure modes.
Relevant Architectural component	Hybrid distribution transformer.
Format	Float
Expected size	12 bytes (3x 4 bytes)
Origin	Pressure sensor

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Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Float with one decimal place. In-tank pressure expressed in mBAR.
Datatype Name	Communication
Description	Communication medium
Purpose	Identify the communication medium connection
Relevant Architectural component	Hybrid distribution transformer.
Format	String
Expected size	15 bytes
Origin	Transformer Monitor
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	String. Communication medium expressed without units.
Datatype Name	Oil Level
Description	Oil level
Purpose	Measure transformer tank oil level
Relevant Architectural component	Hybrid distribution transformer.
Format	Float
Expected size	4 bytes
Origin	Oil level sensor
Access	Transformer Monitor
Recipients	Asset Management Platform

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Info about Metadata	Float without decimal place. Oil level expressed in mm (millimetres).
Datatype Name	Oil moisture
Description	Oil moisture
Purpose	Measure transformer oil moisture
Relevant Architectural component	Hybrid distribution transformer.
Format	Float
Expected size	4 bytes
Origin	Oil moisture sensor
Access	Transformer Monitor
Recipients	Asset Management Platform
Info about Metadata	Float without decimal place. Oil moisture expressed in ppm (parts per million).
Datatype Name	Transformer alarms and trips
Description	General, temperature, pressure and level alarms and trips.
Purpose	Indicate if the transformer reaches the alarm or trip thresholds setup for: general settings; temperature; pressure; and oil level.
Relevant Architectural component	Hybrid distribution transformer.
Format	Boolean
Expected size	16 bytes (8x 2 bytes)
Origin	Transformer Monitor
Access	Transformer Monitor
Recipients	Asset Management Platform

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Info about Metadata	Boolean. Each alarm and trip is expressed as true or false.

2.10 Data used by the P2P market

Table 11 Data used by the P2P market

Dataset Name	Data used by the P2P market
Description	The P2P market enables prosumers in a local network to directly trade energy with each other, by avoiding RES curtailment and future grid transport costs. The P2P trading system is based on blockchain technology that guarantees the transparency and security of the transaction, which remains permanently recorded in the platform, allowing all parties to audit the results.
Security & Privacy considerations	The dataset contains information about the energy behaviour of users who are connected to the grid. Data is anonymised before being saved in blockchain. Moreover, the system is based on a private blockchain, and only authorised users can access it.
Contact Person	Pierluigi Linardi (pierluigi.linardi@eng.it)
Datatype Name	Sales and purchase requests
Description	At market closing, after the clearing price is performed, all the sales and purchase requests are saved in blockchain to ensure the transparency and security of transactions.
Purpose	Data is used as reference levels to validate market agreements and verify that every participant acts as expected.
Relevant Architectural component	DLT-based transactive logic

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Format	Json
Expected size	TBD
Origin	Data will be based on user behaviour in Terceira and Ameland pilot sites
Access	Consortium Partners
Recipients	Project partners
Info about metadata	-

2.11 Stakeholder list and newsletter subscriber list

Table 12 Stakeholder list and newsletter subscriber list

Dataset Name	Stakeholder list and newsletter subscriber list
Description	A database of stakeholder and subscribers to the newsletter will be created to keep track of the contacted/interested subjects.
Security & Privacy considerations	Minimum amount of data will be retained (name, email address, affiliation) and no profiling will be performed. Sendinblue will be used (EU servers, GDPR compliant), which takes all necessary precautions to preserve the security of personal data and, in particular, to prevent it from being accessed by unauthorized third parties, distorted, or damaged. These measures include the following: • Multi-level firewall. • Proven solutions for anti-virus protection and detection of intrusion attempts. • Encrypted data transmission using SSL/https/VPN technology.

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	• Tier 3 and PCI DSS certified data centres.
Contact person	Nora Ganzinelli (nora.ganzinelli@rina.org)
Datatype Name	Stakeholder contact
Description	Name, email, (affiliation) of the person subscribed.
Purpose	Disseminate the project.
Relevant Architectural component	Not associated with IANOS Architecture
Format	Excel
Expected size	<100MB
Origin	Stakeholders who subscribe to the newsletter and/or people who express their interest in the project (privacy statement to be accepted).
Access	Project partners
Recipients	Stakeholders
Info about Metadata	NA

2.12 Smart Energy Router monitoring data

Table 13 Smart Energy Router monitoring data

Dataset Name	Smart Energy Router monitoring data
Description	This dataset comprises i) information about the PV system connected to the Smart Energy Router, including the respective 15-min resolution generation profile; and ii) information about the battery storage system of the Smart Energy Router, including the respective 15-min resolution State of Charge (SoC) profile.

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Security & Privacy considerations	Smart Energy Router complies with IEC 61850 standard, as well as existing European (e.g., GDPR) and national regulations.
Contact Person	Nuno Vilhena (UNINOVA)
Datatype Name	Smart Energy Router – PV generation
Description	Information about the PV system connected to the Smart Energy Router, including the respective 15-min resolution generation profile.
Purpose	Provide iVPP real time information about the generation of the PV system connected to the Smart Energy Router.
Relevant Architectural component	API to communicate between the Smart Energy Router (Physical layer) and the other layers.
Format	TBD
Expected size	TBD
Origin	Smart Energy Router
Access	IANOS consortium members
Recipients	iVPP platform
Info about Metadata	Measurement data (acquired inside the Smart Energy Router) regarding the connected PV system: power, voltage and injected current.
Datatype Name	Smart Energy Router – Battery SoC
Description	Information about the battery storage system of the Smart Energy Router, including the respective 15-min resolution State of Charge (SoC) profile.
Purpose	Provide iVPP real time information about the battery storage system of the Smart Energy Router.
Relevant Architectural component	API to communicate between the Smart Energy Router (Physical layer) and the other layers.

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Format	TBD
Expected size	TBD
Origin	Smart Energy Router
Access	IANOS consortium members
Recipients	iVPP platform
Info about Metadata	Measurement data (acquired through the Smart Energy Router) regarding the connected battery storage system: power, voltage, current and State of Charge.

2.13 IANOS Secured Enterprise Service Bus (ESB)

Table 14 IANOS Secured Enterprise Service Bus

Dataset Name	IANOS Secured Enterprise Service Bus (ESB)
Description	IANOS Secured Enterprise Service Bus (ESB) would communicate with several scattered units across the pilot units. For this purpose, communication from dispersed field-level infrastructure such as AMI/EMS and BMS is established.
Security & Privacy considerations	The Enterprise Service Bus concerns architectural software that solves the communication issues between different fields and external devices eliminating the differences between the protocols considered. Additionally, ESB establishes routes between messages protecting the location or identity between the partners in the communication process. The Secured Enterprise Service Bus in IANOS will securely monitor energy-related and exchange contextual data from field components. IANOS ESB during its developing phase, will take care of security concerns, establishing the appropriate network

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	configuration so that data traffic through the ESB could be separated if necessary, to add extra security measures.
Contact Person	Lucas Bayarrí Pons (lpons.etraid@grupoetra.com)
Datatype Name	Smart Load Agent
Description	Energy data coming from the demand side regarding the Smart Loads, Hybrid Heat Pumps in the system.
Purpose	Serve to further engines in the iVPP Operative Orchestration Toolkit and the IEPT Toolkit.
Relevant Architecture component	FEID-Plus (Terceira) & dEF-Pi (Ameland)
Format	To be determined.
Expected size	To be determined.
Origin	Smart Loads
Access	ESB
Recipients	iVPP platform/IEPT Toolkit
Info about Metadata	-
Datatype Name	HEMS/BMS Agent
Description	Energy data coming from the demand side regarding Home Energy Management Systems and Building Management Systems within the Buildings in the Islands.
Purpose	Serve to Virtual Integration Layer: IEPT Toolkit and iVPP platform.
Relevant Architecture component	FEID-Plus (Terceira) & dEF-Pi (Ameland)
Format	To be agreed.
Expected size	Not determined yet
Origin	Advanced Metering Infrastructure (AMI)

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Access	ESB
Recipients	iVVP Platform /IEPT Toolkit
Info about Metadata	-
Datatype Name	EV Agent
Description	Energy data coming from the demand side regarding EV access points.
Purpose	Serve to Virtual Integration Layer: IEPT Toolkit and iVPP platform.
Relevant Architecture component	FEID-Plus (Terceira) & dEF-Pi (Ameland)
Format	To be agreed.
Expected size	Not determined yet
Origin	Electric Vehicle Supply Equipment (EVSE), Electric Vehicle Charging Infrastructure (V2G)
Access	ESB
Recipients	iVPP Platform /IEPT Toolkit
Info about Metadata	-
Datatype Name	SCADA / EMS Agent
Description	Energy data coming from SCADA and Energy Management System.
Purpose	Serve to Virtual Integration Layer: IEPT Toolkit and iVPP platform.
Relevant Architecture component	FEID-Plus (Terceira) & dEF-Pi (Ameland)
Format	To be agreed.
Expected size	Not determined yet

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Origin	SCADA System
Access	ESB
Recipients	iVPP Platform /IEPT Toolkit
Info about Metadata	-
Datatype Name	BESS Agent
Description	Energy Data coming from Battery Energy Storage Systems.
Purpose	Serve to Virtual Integration Layer: IEPT Toolkit and iVVP platform.
Relevant Architecture component	FEID-Plus (Terceira) & dEF-Pi (Ameland)
Format	To be agreed.
Expected size	Not determined yet
Origin	Flywheel in its relevant pilot, Biobased Battery
Access	ESB
Recipients	iVPP Platform /IEPT Toolkit
Info about Metadata	-
Datatype Name	Storage Vectors Agent
Description	Energy Data coming from Storage Vectors in the system.
Purpose	Serve to Virtual Integration Layer: IEPT Toolkit and iVPP platform.
Relevant Architecture component	FEID-Plus (Terceira) & dEF-Pi (Ameland)
Format	To be agreed.
Expected size	Not determined yet
Origin	Thermal Storage Units, Hydrogen Storage.

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Access	ESB
Recipients	iVPP Platform /IEPT Toolkit
Info about Metadata	-

2.14 Lighthouse Island and Fellow Island telemetry, forecast and optimization data

Table 15 Lighthouse Island and Fellow Island telemetry, forecast and optimization data

Dataset Name	Lighthouse Island and Fellow Island telemetry, forecast and optimization data
Description	Data acquired and stored locally or remotely from IoT devices, energy and other data assets (i.e.: weather stations), regarding energy production and consumption, asset status (i.e.: on/off), forecasting and optimization calculations.
Security & Privacy considerations	The data collected will be stored on a cloud-based platform deployed on a Virtual Data Centre (VDC) of an IaaS (Infra-structure as a Service) provider. The IaaS provider is Altice Portugal Data Center SA, formerly known as Portugal Telecom. They have advanced security protocols for data protection to mitigate any malicious actions. Their Data Centre has several certifications including the: - ISO/IEC 20000, acknowledging the use of best practices in IT Services Management Systems, according to the Cloud Computing services provision, IT Management Services, Security Management Services and Data Center Infrastructure Services, within the "Data Center as a Service".

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	- ISO/IEC 27001, acknowledging the use of best practices in Information Security Management Systems, according to the Cloud Computing services provision, IT Management Services, Security Management Services and Data Center Infrastructure Services, within the "Data Center as a Service". - ISO 9001, Quality Management System. The Data Center has a SOC (Security Operations Center) team in place 24 x 7 with training in security and that uses state of the art SIEM (Security Information Event Management) technology to assure high availability. The cloud virtual Data Center is also protected by several security systems: • Firewall, DMZ & VPN to further secure remote access; • Biometric controls (palm vein system for reading the veins of the hands of each person registered in the system), Alarms, CCTV surveillance, Automatic detection / fire extinguishing system and local support team – protect physical access to servers. Regarding the data storage, the database is encrypted, assuring Client data privacy. Also, weekly backups of the databases are executed to an off-site that are also stored on an encrypted data drive. The software platform uses HTTPS to assure that the information travelling on the web is properly secured.
Contact Person	Jorge Landeck
Datatype Name	Energy generation and consumption data
Description	Metering and status data acquired and stored locally or remotely from smart meters, IoT devices, energy assets, and

	operational platforms regarding energy generation, consumption, and storage.
Purpose	Data to be processed, using computational algorithms, for forecasting and optimization purposes according to the different use cases. Data visualization and analysis through the iVPP platform UI.
Relevant Architectural component	Kiplo Core Platform / Database
Format	Relational SQL database also accessible via API.
Expected size	Several dozen GBs.
Origin	IoT devices, RES assets, EV chargers, operational platforms.
Access	Authorized iVPP users.
Recipients	Confidential, within consortium members and iVPP managers and users of the Ameland and Terceira LH.
Info about Metadata	Data ID day/month/year hour/minutes/seconds Energy asset data variables
Datatype Name	Forecast and optimization data LH
Description	RES generation forecasts, energy assets consumption forecasts, energy storage forecast, usage profiles, EV charging profiles, optimization calculations and results
Purpose	Forecast of energy production and consumption for optimization purposes according to the use cases to be explored with the project
Relevant Architectural component	Kiplo Core Platform / Database
Format	Relational SQL database also accessible via API.

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Expected size	Several dozen MBs.
Origin	Calculations performed by computer algorithms on the iVPP optimization module.
Access	Authorized iVPP users.
Recipients	Confidential, within consortium members and iVPP managers and users of the Ameland and Terceira LH
Info about Metadata	Data ID day/month/year hour/minutes/seconds Energy asset data variables
Datatype Name	Forecast RES generation data FI
Description	RES generation forecasts, energy assets consumption forecasts, energy storage forecast, usage profiles.
Purpose	Forecast of energy production and consumption according to the use cases to be explored with the project replicability Actions in the fellow Islands
Relevant Architectural component	Kiplo Core Platform / Database
Format	.csv
Expected size	>100 MB
Origin	User's device
Access	CNR IIA Users (Lampedusa)
Recipients	Confidential within users themselves and IANOS consortium members
Info about Metadata	Data ID day/month/year hour/minutes/seconds Energy asset data variables
Datatype Name	Control actions and DR scheduling

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Description	List of timestamped commands for Demand Response control of energy assets.
Purpose	Store scheduled and past control actions of energy assets.
Relevant Architectural component	Kiplo Core Platform / Database
Format	Relational SQL database also accessible via API.
Expected size	Several dozen MBs.
Origin	Output of the Demand response module of iVPP
Access	Authorized iVPP users.
Recipients	Confidential, within consortium members and iVPP managers and users of the Ameland and Terceira LH.
Info about Metadata	Data ID day/month/year hour/minutes/seconds Energy asset data variables

2.15 TidalKite system data

Table 16 TidalKite system data

Dataset Name	TidalKite system data
Description	TidalKite use case electricity production.
Security & Privacy considerations	To be kept confidential, disclosure (of totals) to be discussed with SeaQurrent (developer of the technology).
Contact Person	Maarten Berkhout (maarten.berkhout@seaqurrent.com)
Datatype Name	Production profile forecast in kW
Description	Profile of electricity production from a TidalKite unit.
Purpose	Production profile forecast for the integration in the Ameland electricity grid, to service electricity demand and

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	determine reduction of / contribution to electricity storage capacity required.
Relevant Architecture component	-
Format	To be discussed and to be adapted so that it can be integrated in the Ameland electricity grid balancing optimisation.
Expected size	In the range of MB
Origin	SeaQurrent
Access	Ameland LH
Recipients	Ameland LH project manager
Info about Metadata	• Data consists of predicted kW per time unit. • Data ID • actualPower/forecastPower • timestamp

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3 Findable, Accessible, Interoperable, and Reusable (FAIR) Data

3.1 Findable Data

To make data generated/collected by the project findable, it is important to have a naming and versioning convention. IANOS will use a naming convention with the following information:

- Project name/acronym (IANOS)
- Name or abbreviation of Dataset
- Source provider
- Date file created/generated (in YYYY-MM-DD format)
- Version number

For example: IANOS_VERIFY_CERTH_2021-04-01_v1.0

Data is adopting the Semantic Versioning 2.0 scheme to assign a unique version to each release of the data.

In addition to naming convention, the "Guidelines on FAIR Data Management in Horizon 2020" also propose to have Digital Object Identifiers (DOIs) for the data generated during the project. For this reason, the project will use the Zenodo platform [3] to fulfil the DOI requirement. Zenodo is an open-access repository developed under the European OpenAIRE program and operated by CERN. The platform can handle single datasets with up to 50GB size. To help research projects to share data all over the world, the platform also helps by defining and storing some additional metadata provided by the uploader. It is possible to grant access to the data only to a specific group of users or the public. The platform also gives the user the possibility to restrict or open access to data for a fixed period of time.

Concerning the metadata provision, IANOS will not use any formal standard for their creation. Instead, security and privacy guidelines will be followed to ensure

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that only the necessary details are stored, especially when dealing with sensitive personal information. Possible metadata may include: location, grid node identification, energy contract details, descriptors of the pilot setup, energy component descriptors, sensor descriptors, measurement values descriptors etc. Each dataset will include its own list of meaningful metadata.

3.2 Accessible Data

An important part of the FAIR concept is to make data accessible to project partners and when possible, to other researchers and the public. The IANOS project will use the Zenodo platform for the data that the consortium decides to make public.

Given the nature of the data acquired during the pilot implementations, not all data collected will be made openly available. Some of the acquired information is private data subject to GDPR and national regulations and therefore cannot be open without reservations. The data is acquired in real-time and comprises of (but not limited to): individual users' personal data, equipment list including characteristics and usage patterns, energy consumption and energy production profiles.

All sensitive data gathered during the project lifetime will be kept confidential by the consortium partners, namely research participants data from pilot sites. Particular attention will be paid to personal data, which will be codified and destroyed after the project ends. All other collected data, such as real-time energy consumption and renewable energy production, will be anonymized or aggregated and will not be used with any identifying information within the project or in external publications.

The software adopted to access data will use HTTPS (encrypted communications over the web) to assure that the information travelling on the web is properly secured. Data can be accessed using the iVPP or the implemented RESTful API for which an open documentation will be made available.

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3.3 Interoperable Data

Making data interoperable mainly relies on using suitable standards and protocols for data and metadata creation along with appropriate vocabularies (e.g., for providing search keywords).

To facilitate interoperability, a list of standards, protocols and data models that are going to be reviewed, to be used in IANOS project are the following:

- Secure TCP/IP and MQTT protocols to communicate with the IoT devices and energy assets.
- Advanced Message Queuing Protocol (AMQP), an application-level open standardization protocol for messaging-oriented intermediate software, based on TCP/IP. It enables the communication between different message-oriented middleware, providing business processes with the required data and transmitting instructions to achieve objectives.
- Open Automated Demand Response (OpenADR), an open-source information exchange model and global Smart Grid standard used in DR applications.
- Universal Smart Energy Framework (USEF), a framework that can deliver the market model for the buying and selling of energy flexibility, and the architecture, tools, and rules to assure its efficient work. The framework is created to provide all parties involved internationally with fair access to energy market and benefits by introducing a new market-based coordinator mechanism, which optimizes the value of flexibility across all roles in the system.
- Standard ontology like the Smart Applications REFerence ontology (SAREF) or Bricks Schema to define data and metadata vocabularies.
- RESTful API services to communicate among the different platform components.
- S2 standard interface used by dEF-Pi system.

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- IEC 61850 communication standard used by the Smart Energy Router to provide real time information about the battery storage system and PV system to the iVPP.
- Energy System Description Language (ESDL, see https://energytransition.gitbook.io/esdl/) used by ESSIM simulation platform.
- Energy Fflexibility Interface (EFI), an open-source standard that allows communication between smart grids and smart devices, allowing the allocation of flexible energy which helps the transition to affordable and sustainable energy supply. EFI will be implemented into IANOS architecture for the Ameland-related UCs through the dEF-Pi open platform, for exchanging information regarding energy flexibility to the decision-making layer of the iVPP (ReFlex component).
- CHAdeMO V2X protocol, it provides the only available protocol detailing V2X extension for EVs and certified V2X chargers and vehicles.

3.4 Re-usable Data

Data will be stored in servers, either on site of the pilots or on locations indicated by the technology provider.

Public data will be published after the release of the respective deliverable or after the end of the project. The availability of data that contain key information on the end customer's commercial operations should be discussed with pilot sites partners following the terms of the consortium agreement and with the consent of the end user. However, sensitive data will be anonymized and processed/analysed as a part of a larger body of data. No information, from which an individual participant can be identified, will be published. Only anonymized results will be summarized as a part of a research publication.

The availability of data after the end of the project depends highly on the type and content of the data. Therefore, storing data on a public platform needs to be discussed with the contributor of the data.

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The licensing of data and deliverables is not yet specified but data that can compromise commercialization prospects or have inadequate protection of (e.g. personal information), shall not be published. The rest of the data will be openly accessible. If there is an open-source license applicable, some partners are in favour of the Apache License, Version 2.0.

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4 Data Privacy and Management of Personal Data

Raw data used by the IANOS platform components will be stored in secure and reliable databases. A backup plan defining local and remote backup policies will be defined.

Data collection procedures within the project will comply with the European legislation (such as GDPR) as well as national regulations. The project partners involved in the pilots will provide detailed information on the procedures that will be implemented for data collection, storage, protection, retention, and destruction, including confirmation that they comply with national and EU legislation.

It is therefore worth briefly summarizing some of the most important principles applicable in case of data processing. First of all, personal data shall be processed lawfully, fairly and in a transparent manner in relation to the data subject. To this extent, each project partner commits to process personal data in a way that ensures compliance with the principle of purpose limitation, data minimization, accuracy, storage limitation, integrity, confidentiality, and accountability. In any case of processing of personal data, the interested partner will remain accountable and responsible for the data collected during the project and shall be liable to identify the most appropriate lawful basis before starting any processing operations.

Personal data shall be processed in a manner that ensures appropriate security, including protection against unauthorized or unlawful processing and against accidental loss, destruction, or damage, using appropriate technical or organizational measures.

Technical or organizational measures shall permit identification of data subjects for no longer than is necessary for the purposes for which the personal data are

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processed. At the end of the project, all processed personal data shall be destroyed in accordance with the specific law requirements.

Within this context, in order to understand if (i) Partners are going to process, jointly or severally, personal data for the purposes of the project and (ii) which is the flow and management of the said personal data, ENG submitted to all partners a data protection questionnaire ("Data Protection Questionnaire"). The questionnaire has been sent in reference to activities of deliverable D 1.10 "Ethics and Cyber Security Management report", already submitted in M12. According to the answers directly provided by the partners it is possible that for certain activities partners will process personal data.

In the light of the previous considerations the table below identifies the set of activities involving the processing of personal data of individuals belonging to IANOS Consortium.

Table 17 Processing of personal data

Scenario	Solution
IANOS mailing lists	To achieve IANOS results and to manage the workflow among all the partners involved, it has been created a series of mailing lists, namely (i) a general one, where have been indicated at least one contact person per partner, and (ii) one mailing list for each of the work packages. In particular, the scope of the lists is to keep updated the relevant partners upon tasks, events, and the progress of the Project in general. The created mailing lists are restricted only to IANOS partners, and the end of the project will be erased.

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	As part of the management of such mailing lists, i.e. the additions and/removals, are responsibility of the Coordinator (EDP). In any case, each person included in a mailing has the right to opt-out by contacting the project Coordinator.
Meetings and related material	During IANOS meetings it is possible that documents will be created and used, such as agendas, presentations, minutes, and signature lists etc. These documents will be created and managed only inside the Consortium and its partners and will be used only for the purposes of the relevant meeting. Moreover, each partner might have access to the document, which to this extent will be stored in project's shared environment. The storage of these documents will be limited to 5 years after the end of the project. To the extent permissible by law, any person whose personal data will be included therein shall have the right to request at any time to the Coordinator to opt-out.
Workshops/Conferences, training, and dissemination sessions	Events such as workshops, conferences, and plenary meetings might be attended by one or more individuals belonging to the Consortium. In this scenario, personal data such as name, surname, company affiliation, emails, and pictures/video recording might be collected. Such data might be collected and processed not only for the purposes of organising the said event, but also for dissemination. In the latter case, before the publication, the relevant individual might request to opt-out from the publications by emailing to the Coordinator. The

	data will be stored in the IANOS shared environment repository, and the data will be kept for 5 years after the project.
Reporting	Reports providing for updates on the Project progress, as well as on financial data, might contain personal data. These reports might be shared either within and outside the Consortium for compliance purposes with national financial law, and in particular with the EC.
Deliverables, internal documents, and other IANOS reports	During the lifetime of the project, a large series of documents and reports will be produced, like deliverables and/or internal documents etc. These files will be used to fulfil project contractual obligations and shared to: IANOS partners, EC, and, depending on the nature of the document, shared with external individuals (as this might be the case for those deliverables that are classified as public and that might be published on the project's website). In these documents, the name and/or email of authors may be included. As far as the said documents are going to be shared inside the Consortium and distributed to the EC, they will be used only for the purposes of reporting and stored in the IANOS cloud server under the deliverables section. Reports that will be shared publicly (public deliverables) will mention only the Partner name and not any other personal information, unless agreed otherwise with the relevant author. All documents will be kept for 5 more years after the project ends.

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Other scenarios	As a general principle, in any case according to which kind personal data needs to be added in any kind of document for the purposes of the project, the controller (i.e. the document creator) shall have to notify the data subject that his/her personal data will be included into the related document, specifying purposes, retention period, storage requirements etc.

4.1 Blockchain and GDPR compliance

In IANOS the blockchain technology is applied in the context of Use case 1 ”Community demand-side driven self-consumption maximization”, specifically in relation to scenario 2 entitled Self-consumption maximization through P2P energy trading based on DLT. To this end, Engineering implemented a P2P market platform that enables prosumers in a local network to directly trade energy with each other, by avoiding RES curtailment and future grid transport costs.

This study [4] has discussed the application of the European Union's EU General Data Protection Regulation to blockchain technologies. It has been observed that many points of tension between blockchains and the GDPR can be identified. First of all, it is necessary to assess whether it is 'personal data' that is being passed on blockchain technology. According to the GDPR, 'personal data' is defined as 'any information relating to an identified or identifiable natural person. The data that make a person identifiable, directly or indirectly, may be a name, an identification number, location data, an online identifier or one or more features of his physical, physiological, genetic, mental, economic, cultural or social identity' (Art 4 para. 1 [5]). Data protection principles therefore do not apply to:

- anonymous information, i.e. information that does not relate to an identified or identifiable natural person;

- personal data rendered sufficiently anonymous that the data subject cannot or can no longer be identified.

In IANOS each prosumer in the P2P market tool has an Ethereum account associated. An account is made up of a cryptographic pair of keys: public and private. They help prove that a transaction was actually signed by the sender and prevent forgeries. An account is presented as a 42 character hexadecimal address (for example: 0x06012c8cf97bead5deae237070f9587f8e7a266d) and identifies the prosumer inside the blockchain. It is not possible to link the user directly with the given address.

Another point of tension between GDPR regulation and blockchain is the Data Controller. If we assume that personal data are processed on the Blockchain, it is therefore necessary, according to the GDPR, to identify the Data Controller and to define whether this role is held by a single entity or jointly by several entities. The correct identification of this role is an important exercise as it enables the identification of the person or entity to whom the data subject must turn to assert his or her rights under the GDPR. On the other hand, by nature the blockchain is decentralized and it is designed to be managed by different parties, many actors can potentially influence the determination of the purposes and means of data processing. In IANOS the infrastructure provides the use of a private network based on Ethereum blockchain, where only authorized users can access to the platform.

The application of the GDPR may also prove challenging with regard to the right to erasure or the so-called 'right to be forgotten', particularly when reference is made to a Permissionless Blockchain (platform in which anyone can take part, freely carrying out any kind of activity, where the content of the register is public and available to all). Once a public key and associated transactions have been identified, even if the user requests it, there would be no way to delete the information, which would then be part of the blockchain. The particular design of the technology to maintain the history of all transactions that have taken place makes the right to be forgotten very complicated to exercise. In IANOS it is used

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a private blockchain and personal data is managed outside the platform itself, publishing on it only references to information held through a traditional database.

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5 Conclusions and next steps

In this deliverable we reported the third version of the Data Management Plan. The purpose of this Data Management Plan is to provide guidelines to aggregate, maintain, and further distribute collected data for external usage. This document specifies the datasets that are collected from IANOS partners. In each specification, the content of the data is described as well as the format.

This document was created following the guidelines specified by the EC in "H2020 Programme Guidelines on FAIR Data Management in Horizon 2020 (V3.0- 26 July 2016)" along with "ANNEX 1- Horizon 2020 FAIR DMP template".

The final version of the document is planned at M42 with deliverable D1.16. It will provide the last update on how the data are managed and stored throughout the IANOS project.

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[5] “GDPR - Art 4 para. 1,” [Online]. Available: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R0679#d1e2793-1-1.

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