AISOP PROJECT

HANDBOOK

Revision 0

SUMMARY

This document describes processes for quality control, risk management, data management and the communications strategy in the AISOP project

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AISOP

1 Impressum

Internal Reference

Deliverable No.	Not applicable
Deliverable Name	AISOP Project Handbook
Lead Participant	HSLU
Work Package No.	1
Task No. & Name	1.1
Document (File)	**AISOP-D1.1-Project Handbook-C-R_D0_public**
Issue (Save) Date	2023-03-20

Document status

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Document sensitivity

X	**Not Sensitive**	Contains only factual or background information; contains no new or additional analysis, recommendations or policy-relevant statements
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☐	**Sensitive**	Contains analysis or interpretation of results with policy-relevance and/or recommendations or policy-relevant statements
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About ERA-Net Smart Energy Systems

ERA-Net Smart Energy Systems (ERA-Net SES) is a transnational joint programming platform of 30 national and regional funding partners for initiating co-creation and promoting energy system innovation. The network of owners and managers of national and regional public funding programs along the innovation chain provides a sustainable and service oriented joint programming platform to finance projects in thematic areas like Smart Power Grids, Regional and Local Energy Systems, Heating and Cooling Networks, Digital Energy and Smart Services, etc.

Co-creating with partners that help to understand the needs of relevant stakeholders, we team up with intermediaries to provide an innovation eco-system supporting consortia for research, innovation, technical development, piloting and demonstration activities. These co-operations pave the way towards implementation in real-life environments and market introduction.

Beyond that, ERA-Net SES provides a Knowledge Community, involving key demo projects and experts from all over Europe, to facilitate learning between projects and programs from the local level up to the European level.

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2 Table of Contents

3 Introduction

3.1 Purpose and structure of the document

This document sets out the project quality management approach, the risk management plan, the data management plan, and the communication and dissemination plan, for the AISOP project. In combination, these aspects comprise the AISOP 'project handbook'. The handbook is a deliverable in the AISOP project.

The quality management plan includes a description of the overall goals and objectives of the research. It includes a description of the measures that will be put in place to ensure the quality of the research, such as checks on the accuracy and completeness of the work. This includes the criteria for evaluating the success of the project.

The risk management plan includes a description of the potential risks and hazards associated with the research, as well as the steps that will be taken to mitigate, manage or avoid those risks. In addition, the plan outlines the roles and responsibilities of organisations involved in the research and describes how communication and coordination among those individuals will be managed to ensure that risks are identified and managed effectively.

The data management plan comprises a description of the types of data that will be collected and managed as part of the research, as well as the methods and procedures that will be used to collect, process, and store that data. The roles and responsibilities of individuals involved in the management of the research data are described, and the process for communication and coordination among those individuals is outlined to ensure that the data is collected, processed, and stored in a consistent and efficient manner.

In the next version of this deliverable, the communication and dissemination plan describes the ways in which the research findings will be shared with the wider research community and other stakeholders, including publishing articles in academic journals, presenting the research at conferences, and sharing the findings on social media or other online platforms.

4 Quality Management

4.1 Goals and objectives

4.1.1 Introduction

A quality control process is established in AISOP to ensure the success of the project.

This section includes a description of the overall goals and objectives of the research. It includes a description of the measures that will be put in place to ensure the quality of the research, such as checks on the accuracy and completeness of the work. This includes the criteria for evaluating the success of the project.

4.1.2 Key roles in the AISOP project

The project will have a consortium management team (CMT) comprising project owner (PO, chair), project manager (PM), and work package leaders. Each participating country will also have a nominated point of contact with local funding bodies, and a nominated lead for living lab activities who will also sit on the CMT, if not already represented. The consortium management team will have overall responsibility for the project. The Project Officer will be the main contact person for liaison with the ERA-NET project officer.

The project manager will have the day-day responsibility for ensuring that the project meets the technical and scientific objectives and for dealing with operational project-related issues. In particular, the PM will coordinate the provision of all reports and will monitor the timely production of deliverables and the financial budget. The prime roles of the PM will be to:

- Lead, guide and encourage task owners and other project resources,
- Undertake the day to day management of the project activities,
- Set up financial recording and reporting systems,
- Establish and monitor the overall project plan based on the WP plans produced by each task leader,
- Generate project risk assessment procedures and continually assess and manage the mitigation of any potential identified risks to the project,
- Implement issue reporting processes, change control process and configuration management,
- Oversee the development of the project handbook and consortium agreement.

The project officer is identified as:

Organisation name	Fachhochschule Zentralschweiz – Hochschule Luzern
Country	Switzerland
Responsible person	Antonios Papaemmanouil

The project manager is identified as:

Organisation name	ETH Zurich
Country	Switzerland
Responsible person	Turhan Demiray

4.1.3   Goals and objectives of the research

AISOP aims to create an **AI-assisted decision support system for the electric distribution system operators** (DSOs) to drive decarbonisation that is underpinned by **advanced digital technology**. The decision-support system securely and privately acquires, processes, interprets, and exploits data for the benefit of DSO operational planning. In this context, AISOP expands data-driven techniques for improved operational planning in distribution/local grids with high shares of DERs by integrating AI/ML-based solutions, enhanced situational awareness and market incentives. Within the proposed project we combine *(i)* data access and ingestion, *(ii)* distribution grid situational awareness, *(iii)* decision-support for distribution grid management, *(iv)* dynamic tariffs, and *(v)* digital platform integration with exploitation through test and training environments. The developed solutions will be disseminated within EXPERA Knowledge Community, ERA-Net-organised workshops, internet platforms (e.g., website, Linkedin), and national/international workshops/events and conferences, and validated using demo sites and living labs in Switzerland and Germany.

AISOP's overarching mission is to create an AI-assisted decision support system to drive decarbonisation in electricity distribution systems. AISOP project objectives are to:

1. Increase grid observability by using data from multiple sources and in different time resolutions,
2. Help DSOs operate the grid using data-driven decision support tools,
3. Improve the efficiency of network operations,
4. Reduce curtailment of renewable energy and distributed energy resources,
5. Improve options for tariffs for DSO's and prosumers.

4.1.4   Research approach

This section describes the overall methodology for the project. A conceptual architecture for AISOP is provided in Figure 1. AISOP brings together an international consortium of highly qualified partners. An overview of the composition of the individual partners is shown in Figure 3.

The consortium comprises need owners, scientific partners, digital platform providers, demo sites, and SMEs. The Swiss consortium comprises a need owner (Romande Energie), two scientific partners (ETH Zurich FEN and Lucerne University of Applied Sciences and Arts, HSLU), and a digital platform provider (Hive). HSLU contributes the living lab CELL, and Romande Energie provides SCCER-FURIES sites at Rolle and Chapelle-sur-Moudon for data and field activities. LKW participates as an observer of the project. The German consortium comprises two need owners (WWN, ASEW), one scientific partner (ZEDO at TU Dortmund), and a digital platform provider, Logarithmo.
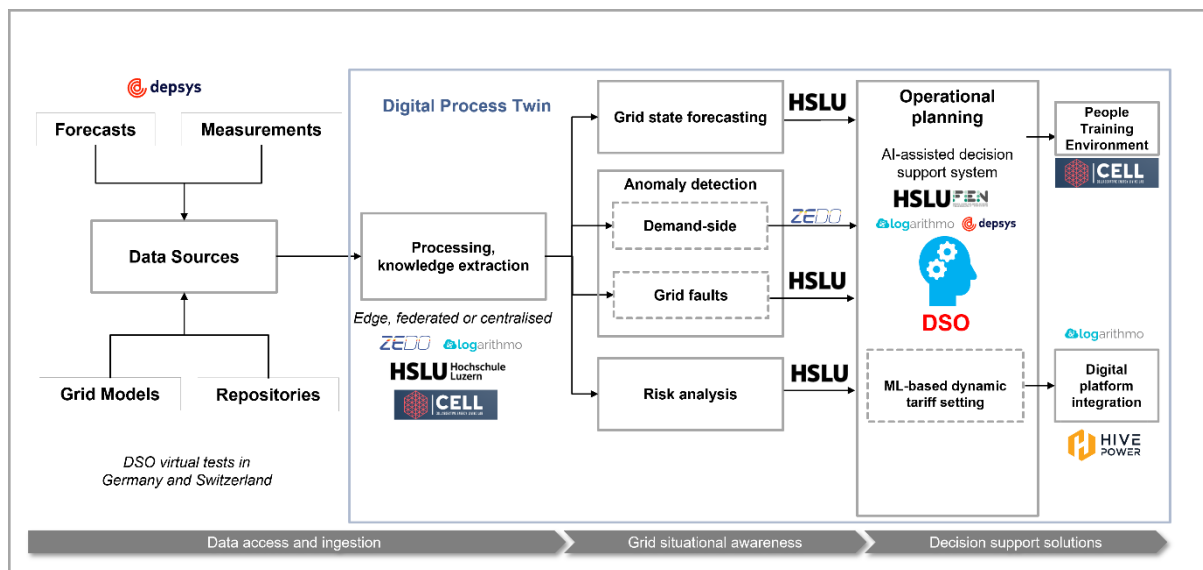
FIGURE 1 – AISOP CONCEPTUAL ARCHITECTURE

4.1.4.1 Data access and ingestion

Partners will extract knowledge from heterogenous data sources by means of statistical clustering, classification, and correlation methods. Non-sensitive data will be centralised into a project repository. Federated, distributed, or edge-based processes will be applied to sensitive data where feasible to maintain privacy and demonstrate the value of such approaches to the DSO. The framework includes the collection and processing of data that is available through deployed conventional and new grid measurements (e.g., PMUs), measurements from distributed energy resources (DERs), as well as advanced metering infrastructure (AMI), combining advanced tools and protocols for acquisition and exploitation of data from distributed sensors.

1.1.1 Tools for situational awareness

Data are used for forecasting the grid state (nodal voltages, branch loadings); predicting asset failure; and forecasting intermittent grid faults. ML and conventional techniques will be exploited to assess benefits. Decision-support tools will be developed, and scenarios will be generated to test and increase the performance of the proposed tools.

1.1.2 Dynamic tariffs

The developed "operational planning framework" includes determining dynamic price signals to steer the customer and prosumer behaviour temporally and spatially in a time-variant manner. Boundary conditions imposed by local energy markets will be investigated using techno-economic simulations on the Hive Platform.

1.1.3 Integrating digital architecture

The system is integrated with a digital process twin. This acts as the digitised representation of (i) the tasks performed by grid operators, (ii) tasks engineered by grid operators but performed by software, and (iii) the secure acquisition and representation of network and consumer data, building upon and expanding the definition of "digital twin" to address the needs of the DSO.

4.1.5 Milestones and key performance indicators

Contractual milestones are listed in Table 1**.**

TABLE 1 - AISOP PROJECT MILESTONES

Milestone # and Name		Month	Date
1	Requirements and characteristics for a "Digital Process Twin" defined	6	11/22
2	AI-based model for grid situational awareness tested by offline simulations	20	02/24
3	ML-based demand-side anomaly detection and identification tool tested by offline simulations	20	02/24
4	ML-based dynamic tariff tested	24	05/24
5	Security-constrained combined dynamic tariff and subsidy scheme tested	24	05/24
6	Security-constrained local flexibility pricing tested	24	05/24
7	Demonstrations completed	35	04/25

No contractual **KPI's** were defined in the project proposal.

4.2   Quality Assurance

4.2.1   Internal review of AISOP deliverables

The AISOP deliverables represent the project legacy and as such are the most important outcome of the project. An elevated level of quality therefore needs to be ensured. Many documents will be stored in a publicly available repository on the ASIOP website; to ensure adequate quality for public dissemination, an internal review process is therefore defined.

Transparency and accountability play an important part in project success. Responsible organisations have therefore been identified for the completion and review of each deliverable, in line with the project programme (Appendix A).

A first complete release of the deliverable will be passed by the document owner to the reviewing organisation at the specified date. The reviewer will provide comments on the document to the document owner within one week of submitting the deliverable. Where minor revisions are required, these will be completed by the deadline specified. In case major revisions are required, a new deliverable completion date may be required, and should be agreed with the coordinator on a case-by-case basis.

The scope of the review includes an assessment of completeness against scope, language, and formatting. Deficiencies in conclusions or scientific method can also be identified in the review process. Code reviews and replication of research are not within the scope of the review process.

4.2.2   Internal review of project milestones

Work package leads are responsible for providing adequate justification for the completion of milestones related to their work packages. In general, milestones are directly linked to project deliverables. The project manager will confirm that the milestone has been achieved based on justification provided by the work package leader.

4.2.3   Interim national reports

The requirements for interim reports are defined by local funding agencies and by ERA-NET. Partners will endeavour to provide input to local reporting requirements where necessary. A shared document will be established to simplify the process and ensure consistency of messaging across the consortium.

4.2.4   Document classification

Documents will be classified according to their distribution status. Distribution status is as follows:

C – Consortium Internal

PU – Public

ERA – ERA-NET / Expera / ERA-Learn

Where documents are classified as Consortium Internal, an executive summary will be provided on the XXXXXX website.

4.2.5   Document storage

A common Sharepoint drive is provided for document storage. Confidentiality requirements are defined in the AISOP consortium agreement. Document and data handling requirements are defined in the Data Management Plan within this document.

Deliverables will be stored in the folder 500 – Deliverables on the shared drive. Deliverables will use the approved project template. A naming convention will be used as follows:

- **AISOP-[Dx.x]-[Short name]-[Level of Dissemination]-[confidentiality level]_[Version]**

Documents will be stored as PDF files on the shared directory.

- [Dx.x] is as defined in the proposal,
- [Short name] is a shortened deliverable name, chosen by the author,
- [Level of Dissemination] is either C, PU or ERA, as defined below,
- [Confidentiality level] is either C, R or P, as defined in Chapter 4,
- [Version] should follow the format D0, D1, D2 etc. for drafts and R0, R2, R3 etc. for releases.

Versions should be listed in a table in the start of each deliverable.

5   Risk Management

5.1   Risk management approach

The risk management plan includes a description of the potential risks and hazards associated with the research, as well as the steps that will be taken to mitigate, manage or avoid those risks. In addition, the plan outlines the roles and responsibilities of organisations involved in the research and describes how communication and coordination among those individuals will be managed to ensure that risks are identified and managed effectively.

A step-by-step approach is used in AISOP:

1. **Identify potential sources of risk.** Periodic risk assessments will be conducted at bi-annual project meetings, including consulting with advisory board members. Categories of risk include:
   a. risks associated with the research methods, and
   b. risks related to the potential outcomes of the research.
2. **Evaluate the likelihood and impact of the risks.** This will help to prioritise the risks and determine which ones require the most attention and resources.
3. **Develop strategies to mitigate or avoid the risks.** Once risks have been identified and evaluated, the next step is to develop strategies to mitigate or avoid those risks, including implementing control measures to reduce the likelihood of the risks occurring, establishing protocols for responding to risks that do occur, and providing training and support to the researchers to ensure they are aware of the risks and how to manage them.
4. **Monitor and review the risks throughout the research project**. Risk management will be conducted as an ongoing process throughout the course of the research project. Risks will be reviewed at the regular AISOP project reviews (bilateral meetings, plenary meetings) and, where appropriate, through the implementation of systems and tools.
5. **Communicate and coordinate with all individuals involved in the research**. Effective risk management requires good communication and coordination among all individuals involved in the research. Clear lines of communication will be maintained via the national and international project meetings. If necessary, training and support will be initiated by partner organisations to ensure that everyone involved in the research is aware of their roles and responsibilities in managing the risks.

5.2   Identified risks

Appendix B shows projects risks identified at the project start. A project risk register is maintained on the shared drive.

6 Data Management

6.1 Data management approach

The purpose of this chapter is to support stakeholders of AISOP, such as project partners, need owners, and observers, with establishing and maintaining a successful data management pipeline that ensures compliance with relevant regulations regarding privacy and confidentiality of data used in AISOP.

Anyone within the consortium who creates data, manages it, or relies on it for decision making and planning is required to adhere to the provisions set out in this Chapter. All Consortium participants who use data, regardless of the form of storage or presentation, are affected by this data management plan.

The purpose of the Data Management Pipeline is to achieve the following:

- Establish appropriate responsibility for the management of data as an asset of the AISOP project.
- Improve the security of the data, including confidentiality and protection from loss.

To support effective and innovative research, project data must be accessible, must correctly represent the information intended, and must be easily integrated across consortium members' information systems. The purpose of data governance is to develop project-wide policies and procedures that ensure that the Consortium meets these criteria within and across data systems.

The Data Management Pipeline addresses data governance structure and includes policies on data access, data usage, and data integrity and integration, establishing policies, procedures and standards regarding data security and privacy protection, data inventories, content and records management, data quality control, data access, data security and risk management, data sharing and dissemination, and ongoing compliance monitoring.

6.2 Data handling guidelines

In AISOP, no research data is held centrally. Data management is dealt with based on data management procedures defined by the partner that owns the data. Transfer is dealt with bilaterally on a case-by-case basis.

General data guidelines throughout the data lifecycle are summarised in Table 2.

TABLE 2 - GENERAL DATA GUIDELINES FOR AISOP

Management Step	Description
Identification	Identify the data that is required, determine its level of classification, and determine the specific individuals who are authorised to access this data.
Storage	Store the confidential data in a secure location, such as a secure server or a physically secure location.
Access control	Implement strict access controls to ensure that only authorised individuals can access the confidential data. This may include password protection, authentication protocols, or other security measures.

Data handling	Establish procedures for handling confidential data, including guidelines for sharing the data with authorized individuals, and for disposing of the data when it is no longer needed.
Auditing	Regularly audit access to the confidential data to ensure that it is being used appropriately, and to identify and address any potential security breaches.

6.3   Data classification in the project

Data in AISOP will be classified according to whether it is:

- **Confidential:** Data that is sensitive or private, and should only be accessed by authorised individuals, as identified in the data management policies identified by the partner organisation. Confidential data includes identifiable data on human subjects. It is anticipated that confidential data will only be accessible to the partner organisation that creates that data.
- **Restricted:** Data that is not sensitive but should only be accessed by consortium members for specific purposes. Restricted data includes data on human subjects that is not identifiable to a specific individual. It is anticipated that restricted data will only be accessible to consortium members.
- **Public:** Data that can be shared freely with the public.

Documents will be classified according to their distribution status (C – Consortium Internal; PU – Public; ERA – ERA-NET / Expera / ERA-Learn).

Deliverables and project documentation should include the appropriate data classification as a footer in the document.

6.4   Data breach

In the event of a data breach, the processes defined by the organisation that was responsible for the breach within the consortium will apply. As a basis, the General Data Protection Regulation (GDPR) requirements can be used as a guide.

In the case of a data breach in a research project, the following steps should be taken, considering the requirements of the GDPR:

1. **Notify the appropriate authorities:** In the case of a data breach, the affected partner should immediately notify the AISOP project manager and the appropriate authorities, such as the partner's data protection authority.
2. **Investigate the breach:** The affected partner should conduct a thorough investigation to determine the cause of the data breach and the extent of the data that has been compromised. The project manager will also investigate.
3. **Contain the breach:** Once the cause of the data breach has been identified, the affected partner should take steps to contain the breach and prevent any further unauthorised access to the data. This may include disabling access to the data, implementing additional security measures, or other actions as appropriate. A description of the steps to be taken will be provided to the project manager.

4. **Notify affected individuals:** If the data breach involves personal data, the affected partner should notify the individuals whose data has been compromised, in accordance with the requirements of the GDPR. This may include providing information about the breach, the type of data involved, and any steps that the individuals can take to protect their data.

5. **Implement corrective measures:** After the data breach has been contained and the affected individuals have been notified, the affected partner should implement corrective measures to prevent similar breaches from occurring in the future. This may include updating policies and procedures, providing additional training for team members, or implementing additional security measures.

6.5   Data sharing between partners

As an international project involving data from multiple DSO's and stakeholders, AISOP is affected by multiple laws and regulations for data handling and transfer. Data transfer between countries should in general be avoided. If data sharing is required for the successful implementation of research, the following steps should be implemented:

1. **Data sharing agreement:** outline the specific terms and conditions for sharing data between the partners, include details such as the types of data to be shared, the purposes for which the data can be used, and any restrictions on sharing or using the data.

2. **Implement security measures:** The involved partners should implement appropriate security measures to protect the data shared between the partners. This may include encryption, access controls, and other measures to prevent unauthorised access or disclosure of the data.

3. **Monitor and audit data usage:** The involved partners should regularly monitor and audit the usage of the data shared to ensure that it is being used in accordance with the data sharing agreement.

6.6   Data to be used in AISOP

An initial data audit has been conducted and is provided in Appendix C.

7 Communication and Dissemination Plan

WP1 will organise, plan and execute dissemination activities to create full awareness of AISOP activities both within and outside Europe. Dissemination activities will be targeted at industry, policy, regulators, academia and the public, using channels including presentations at scientific society meetings, publications in peer-reviewed journals and sectorial magazines, open-source publishing and open access databases. Results will be available online in papers, infographics, technical videos, papers available on website and updates via social media, as described in this chapter.

TABLE 3 - AISOP COMMUNICATION AND DISSEMINATION TARGETS

KPI as defined in proposal	Metric to be measured	How
Website and social media.	A website will be designed and maintained to act as an information portal for the interested members of the public, project stakeholders, energy producers etc. A LinkedIn project account will be created to allow for maximum contact with the professionals of the relevant sectors. The existing communication channels of the project partners such as their websites, LinkedIn, Facebook and Instagram etc. accounts will be used to disseminate the project findings with press releases.	Existence of online presence
Conferences and publications.	Project findings will be disseminated by actively participating in at least 3-4 relevant international conferences on smart grids/cities and applications of data-driven AI/ML-based tools in the energy industry	Publication list
Newsletters, technical factsheets, press releases, leaflets and brochures.	After the first six months, quarterly newsletters will be delivered to the interested members of the knowledge community who are registered via project's website to receive updates about the progress. In the meantime, news about the project progress/outcomes will be posted on the website in a continuous manner, and will be shared in social media such as LinkedIn, Facebook etc. Once the demonstration projects start, press releases will be issued to describe and promote the project objectives as well as the progress to the public. An indicative list of topics, aligned to project outcomes, is provided in Table 4. The communication mediums with the stakeholders and the need-owners include e-mails to receive their contributions, short newsletters in the sectoral magazines (e.g. Energeia magazine by Swiss Federal Office of Energy) and email lists (e.g. ETH Energy	Website publication list Mailing list sign-up monitored using MailChimp

	Science Center email list) for industry stakeholders, conference calls and small-scale in-person meetings together with few relevant participants. We will use our contacts with local IEEE sections in Germany, Denmark and in Switzerland, VDE (Association for Electrical, Electronic & Information Technologies), VSE (Association of Swiss Electricity Companies) as well as Swissmem (The Swiss Association of Mechanical and Electrical Engineering Industries) to organize seminars to inform relevant engineers about the project.	

Meetings and workshops with stakeholders are planned within the project. Since the results of our project are highly relevant for local actors such as the municipalities, distribution system operators, electricity retail sellers, parking lot owners, prosumers etc., our dissemination activities include the organization of and participation in local workshops, and devising policy briefs and recommendations on the utilization of the ubiquitous storage in a coordinated manner.

The workshops will be organized for local actors considering both regional aspects as well as country's regulation framework. There will be at least two workshops per each partner country: one is organized for attendance/contribution of country-wide actors, others will be focused on local actors.

Partners will actively participate in the Knowledge Community meetings (e.g. feedback meetings with evaluating experts), working groups and contribute to EXPERAs living documents. In addition, the project members will ensure to maximize the cooperation efforts by participating in teleconferences and workshops to identify synergies between the projects. Participation in a minimum of 1 joint project presentation activity, organized by the Knowledge Community, is planned and budgeted for.

TABLE 4 – AISOP NEWSLETTER TOPICS

Objective	Details
AISOP articles and newsletters	Articles will be published to coincide with the release of public deliverables. Articles will be grouped to cover deliverables with similar due dates. The text for the article will be closely linked to the deliverable abstract to minimise effort (adapted copy/paste). Newsletters will be released to coincide with articles (replication of content to minimise effort).
Article 1 (M6)	Introduction to AISOP
Article 1 (M9)	Research spotlight – concepts: the operational planning decision support – grid situational awareness using edge and embedded network devices
Article 1 (M12)	Research spotlight - concepts: Digital Twin and Digital Process Twin for distribution system operational planning
Article 1 (M15)	Research spotlight: anomaly detection in operational planning
Article 1 (M18)	Research spotlight: power flow forecasting and risk analysis
Article 1 (M21)	Research spotlight: data access, ingestion and use in the digital process twin for LV operational planning
Article 1 (M24)	Research spotlight: use of dynamic tariffs for operational planning
Article 1 (M27)	Research spotlight: use of agent-based modelling for situational awareness in distribution systems
Article 1 (M30)	Research spotlight: impacts and boundary conditions for peer to peer markets in DSO

	operational planning
Article 1 (M33)	Research spotlight: testing operational planning in Switzerland
Article 1 (M36)	Research spotlight: testing the digital process twin in Germany
AISOP presentations and conference attendance	Where possible AISOP consortium member presentations (e.g. at conferences) will be linked from social media. A list of conferences has been identified in a list maintained separately on the AISOP project directory.

FUNDING