NEEDED

Next generation data-driven reference European models and methods towards silent and green aircraft operations around airports

Horizon Europe | HORIZON-CL5-2022-D5-01-12

Project Handbook

This project receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101095754 (NEEDED).

REVISION HISTORY

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Version	Date	Who	Change
1.0	03.07.2.23	Michele DE GENNARO	Approved with minor modifications.

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PROJECT ABSTRACT

NEEDED responds to the second and third bullets of the “expected outcome” of the HORIZON-CL5-2022-D5-01-12 topic, delivering the next generation data-driven reference European models and methods to estimate present and future aircraft emissions (pollutants and noise), achieving TRL 4 at the end of the project. To do so, NEEDED will advance the state of the art by:

- improving the accuracy of the reconstruction of aircraft operations by using real-world ADS-B data,
- advancing emission inventories for current and future aircraft technologies, while delivering more accurate pollution dispersion models,
- extending the applicability of the ECAC Doc 29 noise model towards future aircraft technologies,
- performing more accurate estimation of the number of people affected by local air transport operations by using dynamic population maps.

These activities are complemented by (i) local air quality (LAQ) and experimental noise measurements performed at Rotterdam Airport, (ii) validation of the NEEDED toolchain in a 30-week pilot study involving three airports, and (iii) delivery of a methodology to optimise the flight patterns for minimum detrimental impact on the population in present and future scenarios. The project aims to function as a technology enabler, laying the methodological groundwork for facilitating the entry into service of transformative aircraft technologies while capitalising on the potential of ADS-B data. NEEDED ensures its impact on the next generation of Air Traffic Management (ATM) regulation and policies through the direct involvement of EUROCONTROL.

The consortium combines a wide portfolio of competences from 10 partners from 7 different EU member states (Austria, Belgium, Italy, Sweden, The Netherlands, France, and Spain) plus 1 non-EU Country and it is coordinated by AIT Austrian Institute of Technology. NEEDED is scheduled to run from January 1st 2023 to December 31st 2026, for a total duration of 48 months and has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement no. 101095754. A full list of partners and funding can be found at: https://cordis.europa.eu/project/id/101095754.

LIST OF ABBREVIATIONS

Acronym / Short Name	Meaning
CA	Consortium Agreement
CINEA	European Climate, Infrastructure and Environment Executive Agency
DMP	Data Management Plan
EU	European Union
EU-GA	EU Grant Agreement
GA	General Assembly
HE	Horizon Europe
PC	Project Coordinator
PM	Person months
PO	Project Officer
RDM	Research data management
RP	Reporting Period
SP	NEEDED SharePoint
Telco	Telephone conference
WP-L	Work package leader

EXECUTIVE SUMMARY

A project management handbook contains all the relevant information and rules in order to successfully execute the project. It documents the project, its management and procedures according to a selected project management standard.

For NEEDED, project coordination is exercised according to the IPMA project management standard, and this is reflected in the structure and content of this document. The project handbook contains (or references) the project plans and the major project management processes, rules and guidelines to follow in the project. It is a living document and is updated as part of project controlling.

The project management handbook is intended to be a work of reference for the involved project participants and facilitates project management by providing structured processes that can be followed.

1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

This project handbook is intended to give an overview of the context, planning and procedures of project NEEDED. The handbook (also referred to as “manual”) contains the specific information, standards and “rules” necessary for executing this project. The elements contained in this manual follow the methodology of the International Project Management Association (IPMA). Where necessary, these are supplemented by additional information. Conversely, where extensive information would have to be duplicated from other project documents, such documents are referenced instead of duplicating the information – also, in some instances, for reasons of confidentiality. Where specifics methods (e.g. tables, charts, graphics) were not needed or not prepared for this project, these respective sections are either omitted, or a remark explaining the omission is made. Furthermore, in some instances, information is not disclosed as this is not fully known, would be too extensive to render, or might simply not be needed.

The project handbook is intended to be a source of reference for consortium members covering day-to-day and periodic activities and procedures. The handbook will be a living document and updated as required throughout the life of the project, typically during project controlling.

1.2 PROJECT MANAGEMENT PROCESS

This handbook is based on the understanding of the project management process, including its component processes, as illustrated in Figure 1. This is reflected in the structure of this handbook, which covers the major component processes such as project start, coordination, controlling, and close down. It should be noted that the project plans were largely elaborated as part of the project proposal before project start, and therefore are not shown in the figure. The communication process is handled in part in the section on project plans, and in part under project coordination. Internal communication is encapsulated in WP7, and external communication in WP6 of this project.

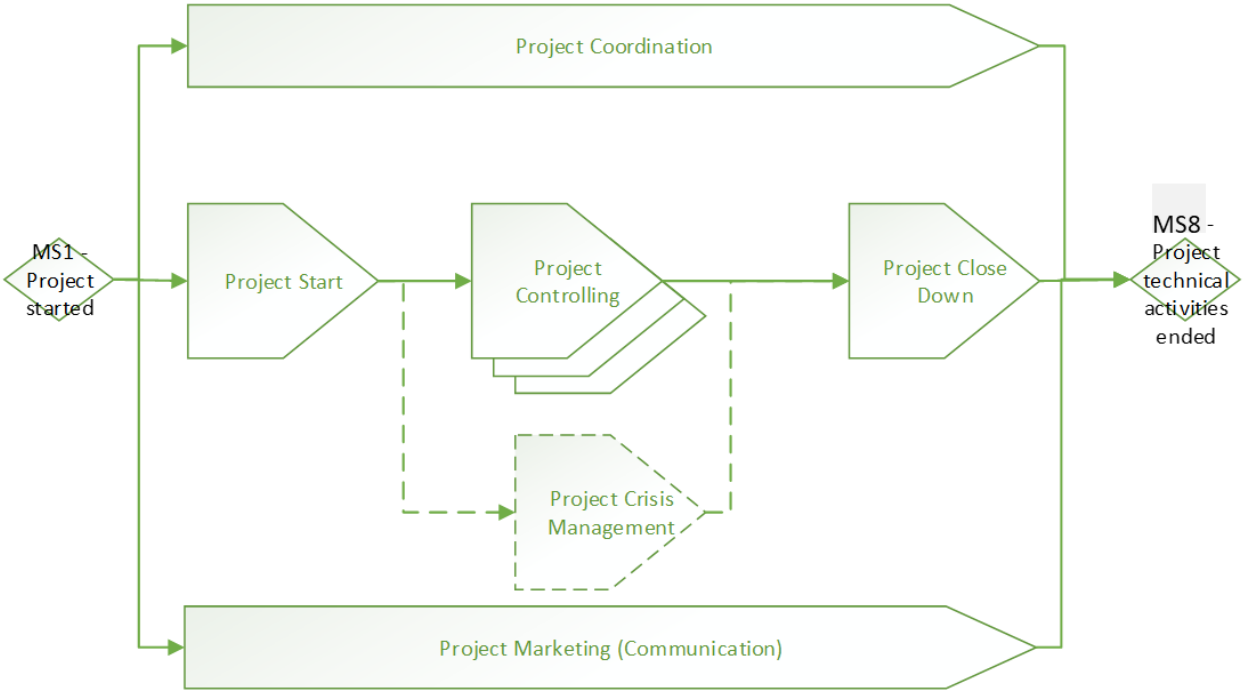


Figure 1 – Project management process according to IPMA, with NEEDED-specific start and end milestones

1.3 PRECEDENCE

The general obligations and rules for project execution are defined in the NEEDED Grant Agreement, which also contains the Description of the Action (DoA). This is supplemented by the Consortium Agreement, which regulates rights, responsibilities and procedures among the members of the consortium. This project handbook does not replace any of these agreements nor any of the EU guidelines for project implementation and documentation. Rather, it supplements these where needed with more detailed operational information, summarizes certain sections, or references them in the original documents.

Where there are any inconsistencies between these documents, the following order of precedence should be applied:

1. EU Grant Agreement (EU-GA)
2. Consortium Agreement (CA)
3. Project Handbook (this document).

2 PROJECT PLANS

2.1 PROJECT ASSIGNMENT

<table>
<tr><td>NEEDED Grant Agreement 101095754</td><td colspan="2">PROJECT-ASSIGNMENT</td></tr>
<tr><td colspan="2">Project start event:
18-19.01.2023 Kick-off meeting held</td><td>Project start date:
• 01.01.2023 technical start of project</td></tr>
<tr><td colspan="2">Project close down event in terms of content:
• Final project meeting/review, expected in M48
Formal project close down event:
As above.</td><td>Project close down dates:
• 31.12.2026 end of technical activities
• 28.02.2027 deadline for submission of final reporting
• 31.12.2029 end of life of the website</td></tr>
<tr><td colspan="2">Project objective:
Delivering the next generation data-driven reference European models and methods to estimate present and future aircraft emissions (pollutants and noise), achieving TRL 4 at the end of the project.</td><td>Complementing activities:
• local air quality (LAQ) and experimental noise measurements performed at Rotterdam Airport
• validation of the NEEDED toolchain in a 30-week pilot study involving three airports,
• delivery of a methodology to optimise the flight patterns for minimum detrimental impact on the population in present and future scenarios.</td></tr>
<tr><td colspan="2">Main tasks (Project phases):
Due to the specifics of how projects in Horizon Europe are typically structured, this project is structured not along phases but along work packages dealing with thematic areas of the project. They are:
• WP1 – Coordination with EUROCONTROL, ICAO CAEP and other international working groups and projects
• WP2 – ADS-B data-driven aircraft operations reconstruction
• WP3 – Airport LAQ models, methods and measurement technologies
• WP4 – Reference noise models and measurement technologies
• WP5 – Dynamic population exposure maps, future scenarios and minimisation of people exposed to LAQ and noise
• WP6 – Dissemination, communication, exploitation and IPR management
• WP7 – Project management</td><td>Project resources and costs:
<table><tr><th>resource/type of cost</th><th>unit</th><th>Costs (€)</th></tr><tr><td>Direct personnel costs</td><td>466.5 PM</td><td>2,783,924</td></tr><tr><td>Subcontracting</td><td>€</td><td>0</td></tr><tr><td>Other direct costs</td><td>€</td><td>405,311</td></tr><tr><td>Indirect costs</td><td>€</td><td>756106</td></tr><tr><td>Total costs (EU partners)</td><td>€</td><td>3,945,341</td></tr><tr><td>Total Cost including Associated Partner</td><td>€</td><td>4,432,216</td></tr></table></td></tr>
<tr><td colspan="2">Project owner:
There is a project owner for each of the 9 beneficiaries and for the Associated Partner of the consortium.</td><td>Project manager:
There is a project manager for each of the 9 beneficiaries and for the Associated partner involved in the project consortium. The overall</td></tr>
</table>

	project coordinator/project manager is Alessandro Zanon (AIT Austrian Institute of Technology)
Project team members:	
• Alessandro Zanon (Project Coordinator, WP2, WP6 and WP7 leader) • Laurent Cavadini, Stavros Stromatas, Zoltan Bazso (ECTL, WP1 leader) • Marco Pretto, Lorenzo Dorbolò, Pietro Giannattasio (UNIUD, T2.2 and T5.2 leader) • Jena Contreras (FR24, ADS-B data provider) • Junzi Sun, Irene Dedoussi, Mirjam Snellen, Anandini Jayanthi (TUDELFT, WP4 leader)	• Xavier Olive, Claire Sarrat (ONERA, WP3 Leader) • Nico Van Oosten, Olena Konovalova, Luis Meliveo (ANOTEC, WP5 leader) • Steven Van der Kleij, Mick Van Hatten (RAB, Airport, infrostructure) • Allan Tart, Martin Strohmeier (OSN, WP1 WP2 and WP5) • Agata Olivato (LEADTECH, WP6 Communication lead)

2.2 PROJECT OBJECTIVES

NEEDED Grant Agreement 101095754	**PROJECT OBJECTIVES**	
Type of objective	**Project objectives**	**Adjusted project objectives as of...**
Main objectives	NEEDED responds to the second and third bullets of the "expected outcome" of the HORIZON-CL5-2022-D5-01-12 topic, delivering the next generation data-driven reference European models and methods to estimate present and future aircraft emissions (pollutants and noise), achieving TRL 4 at the end of the project. To do so, NEEDED will advance the state of the art by: • improving the accuracy of the reconstruction of aircraft operations by using real-world ADS-B data, • advancing emission inventories for current and future aircraft technologies, while delivering more accurate pollution dispersion models, • extending the applicability of the ECAC Doc 29 noise model towards future aircraft technologies, • performing more accurate estimation of the number of people affected by local air transport operations by using dynamic population maps.	• n/a
Complementary	• local air quality (LAQ) and experimental noise measurements performed at Rotterdam Airport, • validation of the NEEDED toolchain in a 30-week pilot study involving three airports, • delivery of a methodology to optimise the flight patterns for minimum detrimental impact on the population in present and future scenarios.	• n/a

2.3 DESCRIPTION OF PRE- AND POST PROJECT PHASE

NEEDED Grant Agreement 101095754	**DESCRIPTION OF PRE- AND POST-PROJECT PHASE**
1) Pre-project phase	
	What triggered the project? • Political and economic context/push to improve the climate and environmental footprint, as well as competitiveness, of different transport modes gave rise, among other calls, to the HORIZON-CL5-2022-D5-01-12 call, under which this project is funded. • Research and Innovation focus of the involved project partners, in conformity with their respective organizational strategies • Desire by involved organizations to build up or expand know-how and IPR in the project focal areas: estimation of flight parameters from ADS-B data, numerical simulation of LAQ and noise emission, experimental measurements of LAQ and noise around airports, development of dynamic population maps and optimize flight patterns
	Relevant documents for the project • Project proposal, submitted in April 2022 • Grant Agreement (GA), which includes the Description of the Action (the project) • Consortium Agreement (CA) • Project documents are stored on the AIT Sharepoint collaboration platform
	Experience from similar projects • Each member of the project consortium has experience from previous projects that is relevant for the activities in NEEDED. These are listed in the project proposal.
2) Post-project phase	
	What will happen after the project has ended? (follow-up activities, further projects, …)? • It is expected that beneficiaries will undertake to exploit the project results according to the Exploitation plan, which is encoded for NEEDED in its deliverables D6.2 and D6.4 • Possibly: follow-up research and/or innovation projects, where some of the beneficiaries from the NEEDED consortium collaborate in new constellations.

2.4 PROJECT ENVIRONMENT ANALYSIS

NEEDED Grant Agreement 101095754	PROJECT ENVIRONMENT TABLE		
Environment	**Relationship** (potential/conflict)	**Measures**	**Who / when** **PSP Code**
Internal project environments			
Project Beneficiaries	These are the 10 partners executing the project.	Regular project communication and coordination. PC keeps all beneficiaries up to date on overall project status and progress, reviews updates from WP leaders.	PC
External project environments			
Academia & research	**HORIZON-CL5-2022-D5-01-12 projects**: These are other projects that, like NEEDED, were funded under the same call. There is a potential to harness synergies in certain domains (e.g. communication, dissemination, joint presence at events, comparison of results.).	CINEA asked all HORIZON-CL5-2022-D5-01-12 projects to cluster. PC is in touch with PCs of the other projects for clustering activities.	PC
International working groups, policy community and expected end-users	NEEDED will be presented in international working groups such as the ECAC EAEG's AIRMOD group (for noise modelling, aircraft performance modelling and input data pre-processing) and the CAEP MDG (which addresses the same modelling topics as AIRMOD, but includes also a task group working on LAQ modelling).	ECTL, through its ongoing membership and contributing role to these groups, will regularly present to the community the calculation methods developed in NEEDED, reporting to the consortium any feedback received as well as any potential corrective actions	PC, WP1 leader

Other	**Project Officer (PO) -** Central point of contact for the project to the funding agency. Function of monitoring, progress review, escalation point for issues. Representative of the funding agency. The funding agency providing the financial EU contribution to NEEDED and handling the associated administrative/contractual aspects. Links to EC and European Parliament.	PC communication with PO; regular updates as needed.	PC, WP6 partners
	EU citizens - Like all projects funded under the H2020 programme, NEEDED has a contractual obligation to communicate the wider context and anticipated benefits of the project to EU citizens (taxpayers).	Communication to non-specialist audiences will be done as part of T6.2 using project website, social media and other collateral and according to the Dissemination and Communication plan (D6.1)	

2.5 RELATIONSHIP TO OTHER PROJECTS AND THE ORGANISATION'S STRATEGY

Predecessor projects and those from which project participants draw experience are listed in the NEEDED project proposal. Since the NEEDED consortium comprises of 10 organizations, it is beyond the scope of this document to detail all the relationships of NEEDED to other projects for each organization. Generally, it can be said that participation in NEEDED is connected to each participating organization's strategy, since every partner is bringing into the project a technology or know-how that is to be further developed. The general objective is to enable each of these actors to better occupy a space along the aircraft emission research.

Furthermore, there is a relationship between NEEDED and other projects funded under the same topic, this being HORIZON-CL5-2022-D5-01-12 - Towards a silent and ultra-low local air pollution aircraft. These are requested by the funding agency to cluster and liaise with each other to exploit potential synergies. The other CL5-2022-D5-01-12 projects are project HOPE, INDIGO, MYTHOS and PANDORA

2.6 PROJECT ORGANISATION

2.6.1 Project Consortium – List of beneficiaries

Participant No.*	Participant short name	Participant organisation name	Country	Type
1. (Coord.)	**AIT**	Austrian Institute of Technology GmbH	Austria	RTO

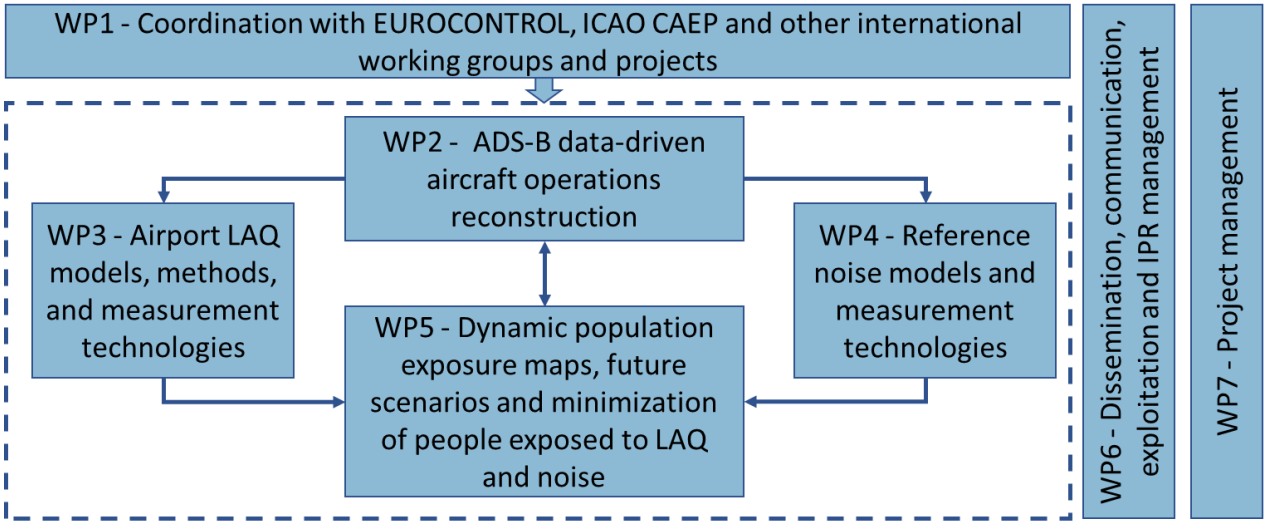
2.	**ECTL**	EUROCONTROL - European Organisation for the Safety of Air Navigation	Belgium	INTGA
3.	**UNIUD**	Università degli Studi di Udine	Italy	UNI
4.	**FR24**	Flightradar24 AB	Sweden	SME
5.	**TUDELFT**	Technische Universiteit Delft	The Netherlands	UNI
6.	**ONERA**	Office National d'Etudes et de Recherches Aerospatiales	France	RTO
7.	**ANOTEC**	Anotec Engineering, S.L.	Spain	SME
8.	**LT**	Lead Tech Srl	Italy	SME
9.	**RAB**	Rotterdam Airport BV	The Netherlands	IND
10.	**OSN****	OpenSky Network	Switzerland	RTO
**Note that OSN is classified as “associated partner” in Horizon Europe..				

2.6.2 Project Organisation Chart

NEEDED Grant Agreement 101095754	**PROJECT-ORGANISATION**	
Role in Project	**Field of duties/Skills**	**Name**
Project Coordinator (PC)	Project coordination, communication, controlling, interfacing with the funding agency (project officer), reporting, contract and financial management. Chair the General Assembly meetings. Further details are given in section 6 of the Consortium Agreement (CA).	AIT Austrian Institute of Technology GmbH (project short name: AIT) is the Coordinator for the project. Alessandro Zanon holds this role for AIT.
Work Package Leaders (WP-L)	Coordinate work package according to the work plan. Review risks related to the WP and escalate if necessary. Participate in Steering Committee; organise feedback with task leaders and involved partners. Report WP progress and contribute/coordinate content to the technical periodic reports.	WP1: ECTL (Laurent Cavadini & Stavros Stromatas) WP2: AIT (Alessandro Zanon) WP3: ONERA (Claire Sarrat) WP4: TUDELFT (Mirjam Snellen) WP5: ANOTEC (Nico Van Oosten) WP6: AIT (Alessandro Zanon)

		WP7: AIT (Alessandro Zanon)
General Assembly (GA)	Meet at least 2x/year. Main decision-making body of the project.	At least one representative from each project beneficiary.
Project members	Execute the tasks of the projects; identify, resolve or escalate issues. Participate in their respective tasks and the GA.	These are listed in SP under 'NEEDED Contact List'

2.7 WORK BREAKDOWN STRUCTURE



2.8 PROJECT WORK-PACKAGE SPECIFICATION

The work packages are detailed in the Grant Agreement for NEEDED. They are also documented on the NEEDED SharePoint, under 'Project Elements', and on SyGMa.

2.9 PROJECT RESPONSIBILITY MATRIX

The following project responsibility matrix is given on an organization level, not on an individual project (team) member level, as the latter are too numerous to fit. Each project partner is responsible for allocating staff to cover the responsibilities in the project responsibility matrix.

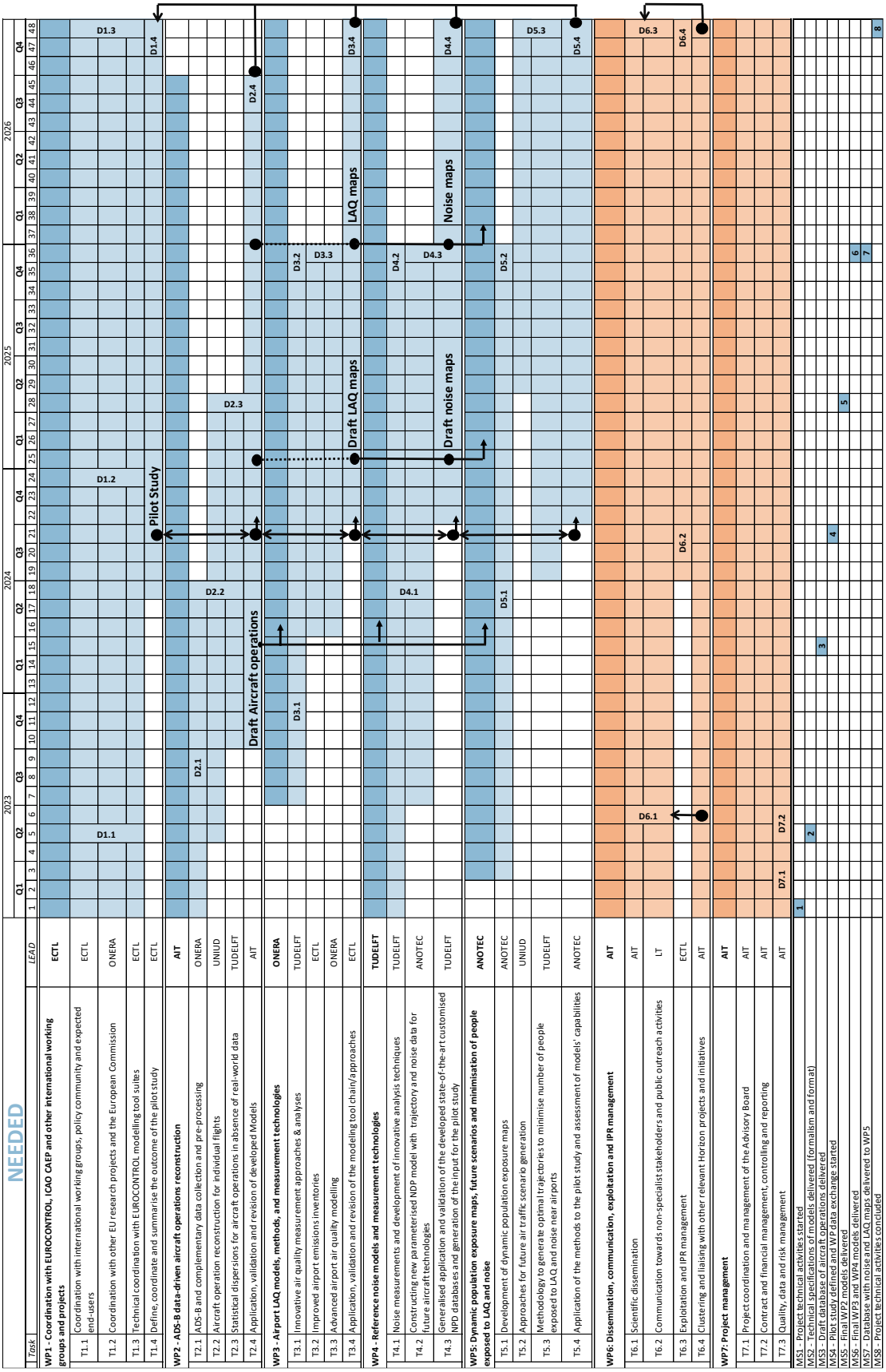
NEEDED, Project Responsibility Matrix			1	2	3	4	5	6	7	8	9	10
			AIT	ECTL	UNIUD	FR24	TUDELFT	ONERA	ANOTEC	LT	RAB	OSN
Task	R=Responsible, S=Supporting	LEAD	1	2	3	4	5	6	7	8	9	10
WP1 - Coordination with EUROCONTROL, ICAO CAEP and other international working groups and projects		**ECTL**	S	R				S	S		S	S
T1.1	Coordination with international working groups, policy community and expected end-users	ECTL	S	R							S	
T1.2	Coordination with other EU research projects and the European Commission	ONERA	S	S				R	S		S	
T1.3	Technical coordination with EUROCONTROL modelling tool suites	ECTL	S	R								
T1.4	Define, coordinate and summarise the outcome of the pilot study	ECTL	S	R				S	S		S	S
WP2 - ADS-B data-driven aircraft operations reconstruction		**AIT**	R	S	S	S	S	S			S	S
T2.1	ADS-B and complementary data collection and pre-processing	ONERA	S		S	S		R				S
T2.2	Aircraft operation reconstruction for individual flights	UNIUD	S	S	R							
T2.3	Statistical dispersions for aircraft operations in absence of real-world data	TUDELFT	S		S		R					
T2.4	Application, validation and revision of developed Models	AIT	R		S		S	S			S	
WP3 - Airport LAQ models, methods, and measurement technologies		**ONERA**		S			S	R	S		S	
T3.1	Innovative air quality measurement approaches & analyses	TUDELFT					R	S			S	
T3.2	Improved airport emissions inventories	ECTL		R							S	
T3.3	Advanced airport air quality modelling	ONERA		S			S	R				
T3.4	Application, validation and revision of the modeling tool chain/approaches	ECTL		R			S	S			S	
WP4 - Reference noise models and measurement technologies		**TUDELFT**		S			R		S		S	
T4.1	Noise measurements and development of innovative analysis techniques	TUDELFT		S			R				S	
T4.2	Constructing new parameterised NDP model with trajectory and noise data for future aircraft technologies	ANOTEC		S			S		R			
T4.3	Generalised application and validation of the developed state-of-the-art customised NPD databases and generation of the input for the pilot study	TUDELFT		S			R				S	
WP5: Dynamic population exposure maps, future scenarios and minimisation of people exposed to LAQ and noise		**ANOTEC**	S	S	S		S	S	R		S	S
T5.1	Development of dynamic population exposure maps	ANOTEC		S			S		R		S	
T5.2	Approaches for future air traffic scenario generation	UNIUD	S		R						S	S
T5.3	Methodology to generate optimal trajectories to minimise number of people exposed to LAQ and noise near airports	TUDELFT					R	S				
T5.4	Application of the methods to the pilot study and assessment of models' capabilities	ANOTEC	S		S		S		R		S	
WP6: Dissemination, communication, exploitation and IPR management		**AIT**	R	S	S	S	S	S	S	S	S	S
T6.1	Scientific dissemination	AIT	R		S		S		S			S
T6.2	Communication towards non-specialist stakeholders and public outreach activities	LT	S				S			R	S	S
T6.3	Exploitation and IPR management	ECTL	S	R		S			S		S	S
T6.4	Clustering and liaising with other relevant Horizon projects and initiatives	AIT	R									
WP7: Project management		**AIT**	R				S	S	S			
T7.1	Project coordination and management of the Advisory Board	AIT	R									
T7.2	Contract and financial management, controlling and reporting	AIT	R				S	S	S			
T7.3	Quality, data and risk management	AIT	R									

2.10 MILESTONE PLAN

#	Milestone name	WP	Date	Lead Beneficiary	Verification Method
MS1	Project technical activities started	7	M1	1 - AIT	Project kick-off meeting held
MS2	Technical specifications of models delivered (formalism and format)	1	M5	2 - ECTL	Models' specifications document delivered
MS3	Draft database of aircraft operations delivered	2	M15	1 - AIT	Draft database of aircraft operations delivered to other WPs (for development)
MS4	Pilot study defined and WP data exchange started	1	M21	2 - ECTL	Pilot study specifications and data exchange detail plan delivered
MS5	Final WP2 models delivered	2	M28	1 - AIT	Numerical models available
MS6	Final WP3 and WP4 models delivered	3,4	M36	5 - TUDELFT	Numerical models available

MS7	Database with noise and LAQ maps delivered to WP5	3,4	M36	6 - ONERA	Database with noise and LAQ maps delivered to WP5 (for development)
MS8	Project technical activities concluded	7	M48	1 - AIT	M48 elapsed and final meeting held

2.11 PROJECT BAR CHART (GANTT)



2.12 RESOURCE PLAN

The **resource plan** gives the planned effort for each participant, expressed in person-months (PM). This is listed in the Grant Agreement and not reproduced here for reasons of confidentiality.

The **project cost plan** is given in Annex 2 of the Grant Agreement and is not reproduced here for reasons of confidentiality. Total funding and funding per beneficiary can also be viewed in the public records:

https://cordis.europa.eu/project/id/101095754

2.13 PROJECT COMMUNICATION (INTERNAL)

This section and its subsections document communication structures and tools inside the project organisation (internal communication).

NEEDED Grant Agreement 101095754	PROJECT-COMMUNICATION			
Title	**Objectives, Content**	**Participants**	**Schedule**	**Location**
Project management meetings	• General project status update • Exchange between WPs • Communicate issues, needs • Controlling of tasks, schedule, resources, costs • Controlling of project environments • Prepare any proposals for decision by GA • Update project handbook	Project Coordinator and WP leaders, open to All	1x / Month	Telco service (MS TEAMS)
WP meetings	• Coordination of WP or task • Discussion of technical progress, issues, next steps	Members of each WP	Usually once per month, or as arranged by WP leader	Telco service or in person
Cross-WP meetings	• Coordination cross WPs or tasks • Discussion of technical progress, issues, next steps	Members of respective WPs	As arranged by WP leaders	Telco service or in person
General Assembly meeting	• General project status update • Decisions and next steps • Workshops, if needed	At least one representative of each partner organisation	1x / year	In-person at a different project partner location, alternating with telco service

Project Review Meetings with PO	• Report and review project progress	PC, WP leaders	After M18, after M36 – as agreed with the PO	In-person in Brussels, unless otherwise agreed with PO
Day to day intra-consortium communication	• Coordinate and execute project tasks, progress technical work, resolve issues.	All	Ongoing/day-to-day	Email, email distribution lists, telephone

2.13.1 Contact and email distribution list

Day to day project communication is generally done by email. A distribution list has been set up for NEEDED including email and phone number together with the responsibility per task. This is located in NEEDED SharePoint > NEEDED Contact List.xslx.

2.13.2 Teleconferencing tools

The PC provides a teleconferencing tool (MS TEAMS) for all plenary telephone conferences (telcos). WP and task leaders can use other teleconferencing tools, depending on what their company standard is or what is available to them (e.g. Webex, Google hangouts, etc.).

2.14 PROJECT "RULES"

Rule	Description
Documentation	Project documentation is stored on the NEEDED SharePoint collaboration platform: The 'versioning' functionality of NEEDED SharePoint is active. Collaborative document editing is available. Work on a single version of the document to avoid a large clutter of different versions of the same document: Don't send large attachments by email – store them on NEEDED SharePoint and send the document link. It avoids unnecessary data duplication. Do not store project information on any other public clouds (confidentiality) WP leaders keep a record (e.g. minutes of meeting) of the developments in their WP and make sure NEEDED SharePoint is up to date with this.
Communication	Project communication is primarily by email and telephone conferences Participants are encouraged to communicate bilaterally as needed: don't hesitate to pick up the phone. Every project partner contributes towards communicating about and marketing the project (as part of WP6 communication and dissemination) Responsiveness: we react to inquiries from project partners in a timely manner. We let partners know if we will be away or unable to answer their request for a longer period of time (manage expectations) Partners respect the confidentiality or sensitive nature of other partners' background or results in the project and apply the proper procedures to obtain clearance for external communication

2.15 PROJECT RISK ANALYSIS

Description of risk (with affected WPs)	PROBAB. *impact*	Proposed risk mitigation measures
Developed models and methods are partially/fully incompatible and not in compliance with international standards (WP1).	LOW *high*	ECTL is a contributing member of several international groups focusing on airport noise and LAQ modelling. ECTL will revise all the developments of NEEDED, ensuring the alignment with international standards.
ADS-B and complementary data quality/availability creates issues in pre-processing and generation of flight operation databases (WP2).	LOW *high*	The partners' experience in pre-processing ADS-B and complementary data and the involvement of two ADS-B data providers will enable careful investigation into any data issues and development of reliable algorithms.
Aircraft performance parameters computed from ADS-B data are not as good as expected (WP2).	MEDIUM *medium*	The analysis of FDR data (provided by RAB) will highlight which parameters are not estimated correctly, prompting a partial revision of the aircraft performance modelling algorithms.
The variability of low-cost sensor measurements (sensitivity, cross-sensitivity, sensor degradation) renders the measured values untrustworthy (WP3).	HIGH *medium*	The sensors will be re-calibrated as needed to correct for these effects. If reliable magnitudes cannot be obtained, it is expected that the shapes of the plumes can still be derived, providing useful input to the modelling activities.
Emissions due to a single event cannot be separated from background level, making plumes impossible to identify (WP3).	LOW *medium*	Based on the first test campaign results, the air quality measurement plan will be revised to maximise the aviation to background ratio, thus minimising the influence of the background concentration levels.
Drone measurements of LAQ are not allowed in the vicinity of an airport (WP3).	MEDIUM *medium*	The airport where these measurements are planned (RAB) is one of NEEDED's partners. This enables and eases the processing of all permits required. Periods with low traffic volume may be chosen to avoid interference.
Direct validation of LAQ models is prevented by background pollutant concentration level in the measurements (WP3).	MEDIUM *medium*	If necessary, the possibility of modelling non-aviation-related emissions that contribute to LAQ will be considered using SotA approaches (e.g., footprint models already available). The LAQ model validation can also be based on other airports providing open LAQ data.

The engine thrust levels as derived from the ADS-B data are not accurate/precise enough to be used for constructing the new NPD tables (WP2, WP4).	LOW *medium*	If this risk occurs, the methodology described under Area #3 for separating and obtaining the engine noise spectrum will be further investigated and adopted to estimate the engine settings (i.e. thrust) for as many flight operations as necessary.
High background levels prevent accurate measurement of noise levels in low-noise areas (WP4).	MEDIUM *medium*	New measurement locations will be selected targeting those with minimum background noise levels, and measurement time slots will be selected accordingly.
General model to predict population mobility near airports cannot be derived/validated (WP5).	MEDIUM *low*	If this risk occurs, the population mobility patterns can be based on available data from mobility surveys. The advantages of considering mobility patterns can be demonstrated on the basis of these datasets.
Optimal near-airport aircraft trajectories and flight procedures cannot be obtained (WP5).	LOW *medium*	Should this risk occur, the optimisation constraints will be re-examined, and their complexity will be lowered until optimal trajectories and flight procedures can be found.
Computational burden of the full NEEDED toolchain and/or of some of its modules is higher than expected (WP2, WP3, WP4, WP5).	*MEDIUM low*	It will be possible to increase the computational power (with partners' large computational infrastructures) and/or adapt simulations resolution and/or reduce the number of test cases analysed with the full toolchain, complementing the simulations with less CPU-intensive SotA methods.
Agreed access to FDR data and/or to RAB resources for experimental measurements is revoked (e.g. for unexpected safety concerns) (WP2, WP3, WP4).	*LOW medium*	In such a case, WP2 can rely on less sensitive data provided by RAB (e.g. passenger load factor) and on engine settings estimated from WP4 measurements. WP3 and WP4 will revise their plans adapting to restrictions and/or lack of data. Validation of all numerical models will rely more on publicly available measurements.

2.16 PROJECT DOCUMENTATION

2.16.1 Document repositories

Area	Description
Files	**NEEDED SharePoint** is the repository for project documentation. For each WP there is a 'Documents' section, where folders for each task and other relevant items can be created. Files belonging to that WP should be placed in the respective folder or appropriate subfolders. **SyGMa:** Another instance where some project documentation takes places is the EC's System for Grant Management (SyGMa). Updates on the status of the project (e.g. deliverables submissions, milestone status, risk assessment, gender and SME reporting) as part of continuous reporting are generally made by the PC. For periodic reporting, beneficiaries can and must input their cost claims and use of resources (person-months, costs, explanations) in SyGMa → see section 4.3.4.

Access Author-isation	**NEEDED SharePoint**
	• PC is the Admin for NEEDED SharePoint with all corresponding rights (Full control)
	• All other users have access rights for the different NEEDED SharePoint resources as follows:
	  ○ Document Libaries ("Documents" and "WPn Documents"): regular users can Edit
	  ○ Project Elements: regular users can Read
	
	MS Sharepoint permissions are:
	• Full Control – Has full control
	• Design – Can view, add, update, delete, approve, and customize.
	• Edit – Can add, edit and delete lists; can view, add, update and delete list items and documents.
	• Contribute – Can view, add, update, and delete list items and documents.
	• Read – Can view pages and list items and download documents.
	• Restricted View – Can view pages, list items, and documents. Documents can be viewed in the browser but not downloaded.
	• Limited Access – Assigned to a user or group when sharing an item. Can access the site and view the selected item.
	
	SyGMA
	For continuous reporting, only the Coordinator and the Project Officer should access this system. For periodic reporting, beneficiaries can and must input their cost claims and use of resources (person-months, costs, explanations) in SyGMa.

Naming convention	• **Final deliverables** are named as per their title in the Grant Agreement, prefixed with the deliverable number, e.g. NEEDED_*Dx.y_Deliverable Name.pdf*. • **Work-in-progress files:** good practise is to prefix such documents with the date in the form *YYYY-MM-DD_Document name.ext*
Rules	• Submission of deliverables to SyGMa is done only by the PC. • Status setting for deliverables, tasks and work packages (in NEEDED SharePoint and/or in SyGMA, as appropriate) should be made only by the PC. • Owners of other documents can make changes to these as needed.

2.16.2 List of Deliverables

#	Deliverable name	WP	Lead	Type	DL	Delivery date
D1.1	NEEDED models/methods/approaches specifications and preliminary report on internal/external coordination	1	ECTL	R	SEN	M5
D1.2	Interim report on internal/external technical coordination	1	ECTL	R	SEN	M24
D1.3	Final report on internal/external technical coordination	1	ECTL	R	SEN	M48
D1.4	Final report on pilot study	1	ECTL	R	PU	M48

D2.1	Preliminary algorithms for ADS-B and complementary data collection and pre-processing	2	ONERA	R	SEN	M9
D2.2	Advanced pre-processing algorithms and preliminary models and methods for aircraft operation reconstruction and statistical dispersion of flight operations	2	UNIUD	R/DATA	PU	M18
D2.3	Advanced models and methods for aircraft operation reconstruction and statistical dispersion of flight operations	2	AIT	R/DATA	PU	M28
D2.4	Final models, methods, and validation for ADS-B data-driven aircraft operation reconstruction	2	AIT	R	PU	M45
D3.1	Preliminary test plan for LAQ measurements	3	TUDELFT	R	SEN	M12
D3.2	Report on NEEDED measurement approach for emissions and air quality: methodology, performance, and results	3	TUDELFT	R	PU	M36
D3.3	Report on LAQ models technical improvements	3	ONERA	R/DATA	PU	M36
D3.4	Report on LAQ models performance and future outlook	3	ECTL	R	PU	M48
D4.1	Preliminary methodology for customising NPD tables and preliminary NPD tables for near-future aircraft technologies	4	TUDELFT	R	PU	M18
D4.2	Final methodology for customising NPD tables and customised NPD tables for RAB	4	TUDELFT	R	PU	M36
D4.3	NPD/performance tables for near-future aircraft technologies and preliminary results of models' validation	4	ANOTEC	R/DATA	PU	M36
D4.4	Final report on validation of the models and methodologies	4	TUDELFT	R	PU	M48
D5.1	Preliminary report on population exposure maps	5	ANOTEC	R	PU	M18
D5.2	Final report on population exposure maps	5	ANOTEC	R	PU	M36
D5.3	Report on methodologies for future scenario generation and aircraft trajectory optimisation	5	TUDELFT	R	PU	M48
D5.4	Final report on validation of the models and methodologies	5	ANOTEC	R	PU	M48
D6.1	Dissemination and communication plan	6	AIT	R	PU	M6
D6.2	Preliminary exploitation strategy	6	ECTL	R	PU	M21
D6.3	Final dissemination and communication report	6	AIT	R	PU	M48
D6.4	Final exploitation strategy	6	ECTL	R	PU	M48

D6.5	Dissemination and communication plan– RP1 updated	6	AIT	R	PU	M6
D6.6	Dissemination and communication plan – RP2 updated	6	AIT	R	PU	M6
D7.1	Project handbook	7	AIT	R	PU	M3
D7.2	Data management plan	7	AIT	DMP	PU	M6
D7.3	Data management plan – RP1 updated	7	AIT	DMP	PU	M18
D7.4	Data management plan – RP2 updated	7	AIT	DMP	PU	M36
D7.5	Data management plan – Final update	7	AIT	DMP	PU	M48

Type codes: (R = report; DEM = demonstrator; DEC = website, press, media action; DATA = datasets (intended as open data); DMP = data management plan; ETHICS / SECURITY / OTHERS).

Dissemination level (DL) codes: (PU = public, fully open; SEN = Sensitive, limited under the conditions of the Grant Agreement; CI = classified (EU Restricted/Confidential/Secret), as per EC Decision No. 2015/444).

3 PROJECT START

3.1 MINUTES – PROJECT START

The technical project start for NEEDED was on 1.1.2023. The project kick-off meeting, which represents the actual start, successfully took place on 18-19.01.2023 at the premises of the Coordinator, AIT Austrian Institute of Technology GmbH in Vienna, Austria. The minutes of meeting as well as presentations and any other documentation relating to the kick-off are stored on the project file repository at *HOME > GA Meetings > Kick-off*. With the completion of the kick-off meeting, *MS1 Project started* was achieved.

3.2 FOLLOW-UP WORKSHOP

A follow-up workshop to the kick-off meeting was not held. The work packages WP1, WP2, WP4, WP6 and WP7 were launched at the kick-off meeting. Further project activities will unfold in these work packages. The other WPs will be launched as per their planned start dates.

4 PROJECT COORDINATION

4.1 MINUTES

Minutes of meetings for project coordination are all stored on the NEEDED SharePoint document sharing platform. Minutes from plenary telecalls and General Assemblies are placed in the 'Home > Regular plenary telcos' section. Those minutes of meeting prepared for WP meetings should be placed in the respective WP folders.

4.2 PROJECT COMMUNICATION

Regular internal communication takes place in the fora and on the schedules described in section 2.13. The available communication tools are likewise described in that section.

External communication in the sense of dissemination and communication about the project and its wider context is done as part of WP6. For external communication, the measures will be developed and executed in T6.2 Communication towards non-specialist stakeholders and public outreach activities. T6.2 is under responsibility of LT, supported by AIT.

A project website will be set up at the domain https://www.needed-project.eu/. Furthermore, selected social media channels (e.g. Twitter, Facebook, LinkedIn) will be set up for the project and will be used to communicate with the identified. The communication strategy will be documented in D6.1 Dissemination and communication plan.

Furthermore, for reasons of quality assurance and IPR/confidentiality, it is important to follow the approval procedures for external communication.

4.3 PROCEDURES AND PROCESSES

4.3.1 Review of Deliverables

Purpose: Ensure IPR/confidentiality is respected and quality of the deliverable is adequate prior to publication.

Responsibilities: Deliverable Owner refers to the beneficiary of the NEEDED project who is responsible for delivering the document (cf. 2.16.2). Reviewer refers to a project beneficiary who is responsible for the completion of the internal review of the deliverable before it is submitted to CINEA.

Procedure and timing: T is the due date for delivery. Numbers represent calendar days.

- T-20 Deliverable Owner sends deliverable to Reviewer (WP-L for the deliverable in cc)
- T-10 Reviewer sends comments to owner as Track Changed document
- T-03 Deliverable Owner sends revised Deliverable to Reviewer
- T-00 Reviewer confirms acceptance of the Deliverable. PC uploads it to SyGMa.

4.3.2 External communication

In the context of this project, external communication is any project-related information released by the consortium or any member of it to parties outside the consortium, regardless of the form it may take (e.g. deliverable, press release, scientific publication, PowerPoint slides for conference presentation, etc.).

Information shared by the partners within the project consortium and designated for external communication must be handled with proper care and diligence. This is of utmost importance in order to support IPR management, maintain confidentiality of sensitive information and generally support a trustful atmosphere for collaboration. This applies particularly where one partner plans to externally communicate information that may also include another partner's background or results.

Regulations and procedures relating to external communication are contained in the Consortium Agreement in section 8.4 Dissemination.

4.3.3 Register of dissemination and communication measures

Dissemination and communication are part of the contractual obligations of every HE-funded project. In order to be able to properly track and report dissemination and communication measures that have been undertaken, a register of these will be kept. This is located on NEEDED SharePoint under Documents > WP6 > T6.1. The task leader for T6.1 is responsible for maintaining the list.

4.3.4 Periodic reporting

The HE Online Manual gives an overview of the structure and content of periodic reports here.

Periodic reporting must be performed after the end of each Reporting Period (RP).

There are three RPs in NEEDED:

- Reporting Period 1 (RP1): M1-M18 (January 2023 – June 2024)
- Reporting Period 2 (RP2): M19-M36 (July 2024 – December 2025)
- Reporting Period 3 (RP3): M37-M48 (January 2026 – December 2026)

Sixty days after the end of each reporting period, a periodic report is due. A periodic report consists of a technical report, which summarises the technical activities and outcomes, and financial reporting by each beneficiary.

Procedure for technical reporting:

1. T-60: At the end of each RPx, PC issues reporting template for technical report to all WP-L;
2. T-30: WP-Ls compile inputs from participating partners and submit WP technical report to PC;
3. PC compiles and edits the final technical report;
4. T-20: PC submits draft final report to SC for review;
5. T-10: SC provides feedback, if any. PC incorporates feedback into the report as appropriate;
6. T-0: PC submits complete reporting package (technical + financial reports).

Procedure for financial reporting:

1. T-60: At the end of each RPx, PC notifies all beneficiaries to begin compiling their financial figures and use of resources for the RP that has just ended.
2. T-20: By this time, all beneficiaries have input and submitted to PC (using the SyGMa functionality) their financial data and use of resources. PC reviews the financial reports. If necessary, PC sends back to the beneficiary for review and resubmission to PC.
3. T-5: all beneficiary financial reports are finalised, ready to be submitted by the PC in SyGMa
4. T-0: PC submits complete reporting package (technical + financial reports).

4.3.5 Issue resolution and escalation

Issues should always be resolved on the lowest possible level and should be escalated to the next higher level if a resolution is not possible, risks taking too long, or if in any case the next higher instance in the chain of escalation should be informed due to the (potential) severity of the issue.

The chain of escalation is: Task leader → WP leader → Project Coordinator → General Assembly → Issue resolution according to CA.

4.4 DATA MANAGEMENT

Research data management (RDM) is mandatory in Horizon Europe for projects generating or reusing data. NEEDED will produce a Data Management Plan (DMP), which will be documented in *D7.2 Data Management Plan*. The OpenAire RDM Glossary[1] gives the following general definition of a DMP:

Data Management Plan (DMP) is a formal document that outlines how data will be handled throughout the research data lifecycle – from planning, through collecting, analysing, publishing, preserving, to sharing and reusing.

In Horizon Europe, DMPs are mandatory and a template to guide the preparation of DMPs is provided. The list of points to be addressed includes data types and formats, compliance with the FAIR principles, (metadata, repositories, controlled vocabularies, licences, etc.), legal requirements (intellectual property rights, GDPR), costs of preservation, data security and ethics, retention periods.

Online tools that can facilitate the preparation of DMPs are available:

- *Argos*
- *DMP online*
- *Data Stewardship Wizard*

Practical advice:

- *A DMP is a living document, which should be updated as the project develops. Any deviations from the original proposal can be documented and explained.*
- *If possible, make the DMP publicly available.*

[1] https://www.openaire.eu/rdm-glossary#data-management-plan

4.5 QUALITY

Quality here relates here to the quality of project processes and deliverables. Quality control is important to ensure, for instance:

- restricted no confidential or other information is leaving the consortium without proper clearance;
- content is comprehensible and correct;
- visual appearance is at least adequate and in-line with project branding.

4.5.1 Deliverables and publications

Deliverables = public or sensitive (confidential).

Publications = abstract, scientific paper, presentation, press release or similar documents going to any individual or group outside of the consortium

The following should be checked as part of the process “Review of Deliverables”. The deliverable…

- uses the current project template, if applicable (location: NEEDED SharePoint → *Documents > Document templates*)
- contains an acknowledgement of EU funding
- features proper spelling and grammar (project standard is UK English)
- has properly captioned tables and figures
- makes consistent use of terminology and abbreviations
- its abbreviations are explained in the list of abbreviations
- uses an agreed citation format.

4.5.2 Acknowledging EU funding

EU funding should be acknowledged in all publications and official project documents. Acknowledgements with proper wording about EU funding are already included in the project document templates for Deliverables and for PowerPoint presentations, usually on the cover page or on the last page. The wording is:

“This project receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101095754 (NEEDED).

When acknowledging EU funding, it should also be checked that the publication is conform with the guidelines of the use of the EU emblem, which can be found here:

https://ec.europa.eu/info/files/use-eu-emblem-context-eu-programmes-2021-2027_en

Deliverables should include this disclaimer:

“This publication reflects only the author’s view. The European Commission and the European Climate, Infrastructure and Environment Executive Agency (CINEA) are not responsible for any use that may be made of the information it contains.”

5 PROJECT CONTROLLING

Project controlling is done periodically by the PC and WP-Ls as part of the regular Project management meetings. The PC and WP-Ls perform controlling on project level, not for every individual partner, except where the partner-specific evaluation is needed for the overall evaluation, for instance in part 7 of the project status report, see below. Each beneficiary is responsible for their own financial and resource controlling. The financial and person-month figures are reported as part of periodic reporting (cf. section 4.3.4).

Once a controlling session is completed:

- The PC updates the project status report in the project handbook (see section **Error! Reference source not found.**)
- The PC issues an updated version of this project handbook
- The PC updates, if applicable, the Risks section in SyGMa.

5.1 MINUTES – PROJECT CONTROLLING

Minutes of meeting for project controlling will be saved at NEEDED SharePoint > *Documents* > *WP7* > *Meetings*.

6 PROJECT CLOSE DOWN

Activities and outcomes relating to project close down will be documented by or shortly after the project close down event, cf. section 2.1.

6.1 PROJECT CLOSE DOWN REPORT

To be done around project close down event.

6.2 MINUTES – PROJECT CLOSING

To be written after closing event.

7 CONCLUSIONS

This project management handbook outlines the project plans for NEEDED conceived before the project start (as part of the project proposal) and documents the key information for each of the component processes of the project management process, based on the IPMA standard and supplemented as and where needed. It is the reference document for all project participants to quickly find key information relating to the NEEDED project. It is a living document and will be updated as part of regular project controlling.