Delivering the 3b generation of LNMO cells for the xEV market of 2025 and beyond

Project Management Handbook

Horizon 2020 | LC-BAT-5-2019
Research and innovation for advanced Li-ion cells (generation 3b)
GA # 875033

Deliverable No.	D9.1	
Deliverable Title	Project Management Handbook	
Due Date	31-03-2020	
Deliverable Type	REPORT	
Dissemination level	Public	
Written By	Boschidar Ganev (AIT)	19-02-2020
Checked by	3beLiEVe Steering Committee	23-03-2020
Approved by	Boschidar GANEV (AIT)	30-03-2020
Status	Final	30-03-2020

This project has received funding from the European Union's H2020 research and innovation programme under Grant Agreement no. 875033.

Revision History

Version	Date	Who	Changes
1	30.03.2020	B. Ganev	Initial version, following SC call and review.

Project Abstract

3beLiEVe aims to strengthen the position of the European battery and automotive industry in the future xEV market by delivering the next generation of battery cells, designed and made in Europe, for the electrified vehicles market of 2025 and beyond. The project activities are focused on three domains:

- Development of automotive battery cells that are highly performant (high energy density, fast charge capability, long cycle life) and free of critical raw materials such as cobalt and natural graphite;
- Development and integration of sensors into and onto the cells to enable smart, adaptive operating strategies and advanced diagnostics in order to extend the useful life of the battery in first and second life applications and improve safety;
- A comprehensive manufacturing approach that is designed from the outset for a circular economy and industrial volumes. This encompasses green manufacturing processes for cell, module and pack, as well as recyclability assessment of the components, and a target lifecycle cost of 90 €/kWh at scale.

The project will deliver two 12kWh-demonstrator battery packs at TRL6 and MRL8. These aim at demonstrating the 3beLiEVe technology performance for applications in light duty (i.e. passenger cars, freight vehicles) and commercial vehicles (i.e. city buses and trucks) in fully electric/plug-in hybrid (BEV/PHEV) configurations.

The strong and complementary consortium of 21 partners from 10 different European countries representing industrial companies, SMEs, RTOs and academia is coordinated by AIT Austrian Institute of Technology. 3beLiEVe is scheduled to run from January 1st, 2020 to June 30th, 2023, for a total duration of 42 months and has received funding from the European Union's H2020 research and innovation programme under Grant Agreement no. 875033. A full list of partners and funding can be found at: https://cordis.europa.eu/project/id/875033.

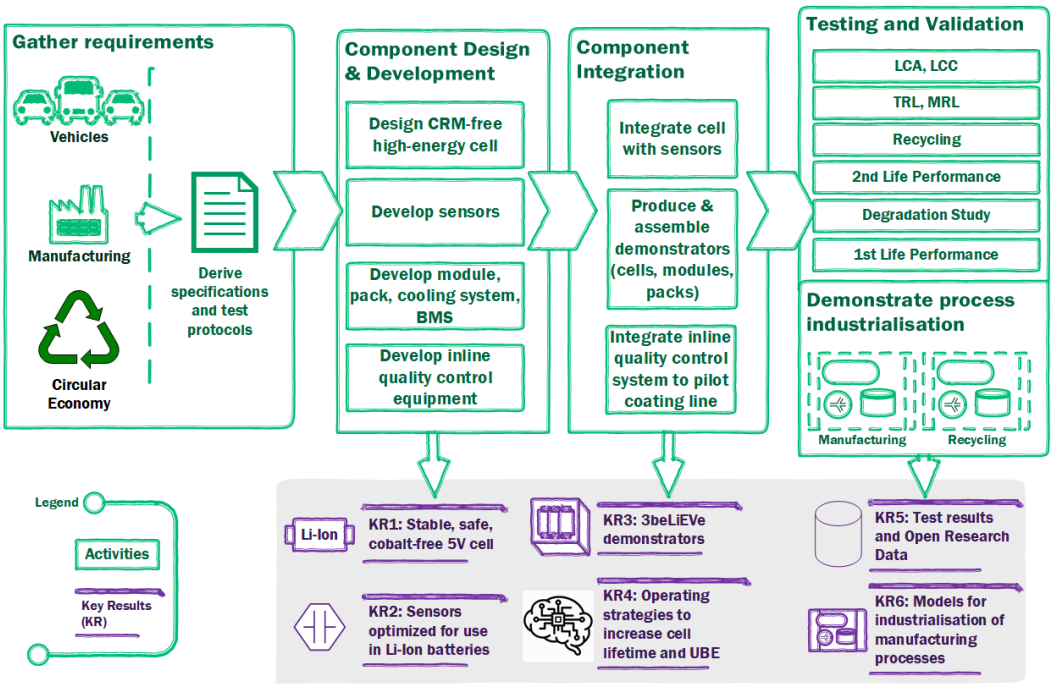

Figure 1: Overview of major 3beLiEVe project steps

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 3beLiEVe, 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.

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List of figure and tables

List of abbreviations

Acronym / Short Name	Meaning
CA	Consortium Agreement
DC	Deputy Coordinator
EU	European Union
EU-GA	EU Grant Agreement
GA	General Assembly
INEA	Innovation Networks Executive Agency
ORDP	Open Research Data Pilot
PC	Project Coordinator
PM	Person months
PO	Project Officer
RP	Reporting Period
SC	Steering committee
Telco	Telephone conference

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 3beLiEVe. 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, since 21 organizations are participating in the project, 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 2. 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 WP9, and external communication in WP8 of this project.

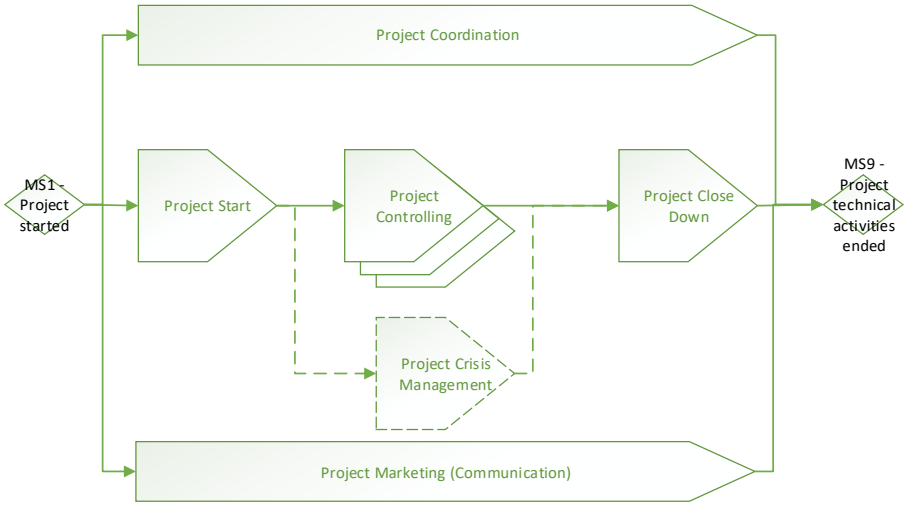


Figure 2: Project management process according to IPMA, with 3beLiEVe-specific start and end milestones

1.3. Precedence

The general obligations and rules for project execution are defined in the 3beLiEVe 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 colspan="2">3beLiEVe
Grant Agreement 875033

PROJECT-
ASSIGNMENT</td></tr>
<tr><td>Project start event:
• 14.01. – 16.01.2020 Kick-off meeting held</td><td>Project start date:
• 01.01.2020 technical start of project
•</td></tr>
<tr><td>Project close down event in terms of content:
• Final project meeting/review, expected in M42
Formal project close down event:
• As above.</td><td>Project close down dates:
• 30.06.2023 end of technical activities
• 31.08.2023 deadline for submission of final reporting
• 30.06.2026 end of life of the website</td></tr>
<tr><td>Project objectives:
Develop and demonstrate production of the next-generation (generation 3b) of high-energy LNMO cells with sensors suitable for xEV applications and compatible with a circular economy, as well as to demonstrate European manufacturing capability. Please see section 2.2 for more details.</td><td>Non-objectives:
• Extensive materials development work
• Integration of battery pack demonstrators into a vehicle</td></tr>
<tr><td rowspan="2">Main tasks (Project phases):
Due to the specifics of how projects in Horizon2020 are typically structured, this project is structured not along phases but along work packages dealing with thematic areas of the project. They are:
• WP1– Technical requirements and specifications
• WP2– Materials selection for 3beLiEVe battery cells
• WP3–Cell architecture design and prototyping of the pilot cells
• WP4–Design and development of sensors, cooling, smart BMS, module and pack
• WP5–Advanced manufacturing methods and equipment
• WP6–Production of the 3beLiEVe cells, modules and demonstrator packs
• WP7–Testing, qualification and ex-post assessment
• WP8–Dissemination, Communication, IPR management and Exploitation
• WP9–Project Management
• WP10–Ethics</td><td>Project resources and costs:
<table>
<tr><td>resource/type of cost</td><td>unit</td><td>Costs (€)</td></tr>
<tr><td>Direct personnel costs

Subcontracting

Other direct costs

Indirect costs</td><td>1120.6 PM
€
€
€</td><td>6,621,801

137,100
1,935,526
2,139,332</td></tr>
<tr><td>TOTAL</td><td>€</td><td>10,883,759</td></tr>
</table></td></tr>
<tr><td>Project owner:
There is a project owner for each of the 21 beneficiaries involved in the project consortium.</td><td>Project manager:
There is a project manager for each of the 21 beneficiaries involved in the project consortium. The</td></tr>
</table>

	overall project coordinator/project manager is Boschidar Ganev (AIT Austrian Institute of Technology)
Project team members:	
• Boschidar Ganev (Project Coordinator, WP9 leader) • Michele Gosso (WP1, WP7 leader) • Marine Reynaud (WP2 leader) • Marcus Jahn (WP3 leader) • Richard Cottet (WP4 leader)	• Claudio Lanciotti (WP5 leader) • Christopher Wolter (WP6 leader) interimistically for Sebastian Kraas • Moritz Teuber (WP8 leader) • Michele De Gennaro (Deputy PC)

2.2. Project Objectives (objectives, non-objectives)

3beLiEVe Grant Agreement 875033	**PROJECT OBJECTIVES**	
Type of objective	**Project objectives**	**Adjusted project objectives as of...**
Main objectives	The overall aim of 3beLiEVe is to develop and demonstrate production of the next-generation (generation 3b) of high-energy LNMO cells with sensors suitable for xEV applications and compatible with a circular economy, as well as to demonstrate European manufacturing capability to cover the whole value chain from cell to system level. The project aims to respond to all objectives set in the LC-BAT-5-2019 topic. To this end, the overall aim is broken down into five key objectives across three thematic pillars. The objectives are: • Deliver a cobalt-free Li-ion battery cell for xEV applications • Develop sensors for cell and module monitoring • Develop inline quality control equipment • Demonstrate the developed battery technologies and process industrialisation • Demonstrate the fitness of the solution for a circular economy. Each project work-package has its own, more detailed objectives in support of the overall objectives. These are detailed in the GA.	• n/a
Non-objectives	• Integration of battery packs into vehicles • Extensive cell active material development work	• n/a

2.3. Description of Pre- and Post Project Phase

3beLiEVe Grant Agreement 875033	**DESCRIPTION OF PRE- AND POST-PROJECT PHASE**

1) Pre-project phase

What triggered the project?

- Political and economic context/push to build up a European automotive battery industry. In October 2017, Vice President Šefčovič launched "The European Battery Alliance" (EBA). Subsequent research funding to this end gave rise, among other calls, to the H2020 call LC-BAT-5-2019, under which this project is funded.
- Research and Innovation focus of the involved project partners, in conformity with their respective organizational strategies and relative to the domain of energy storage/automotive batteries
- Desire by involved organizations to build up or expand know-how and IPR in order to be able to play a part in the value chain of automotive battery production
- Funding opportunities for battery-related research and innovation, e.g. under Horizon 2020.

Relevant documents for the project

- Project proposal, submitted in April 2019
- Grant Agreement (GA), which includes the Description of the Action (the project)
- Consortium Agreement v4d dated 31.01.2020 (CA)
- Project documents are stored on the collaboration platform EMDESK.com

Experience from similar projects

- Each member of the project consortium has experience from previous projects that is relevant for the activities in 3beLiEVe. These are listed in the project proposal.

2) Post-project phase

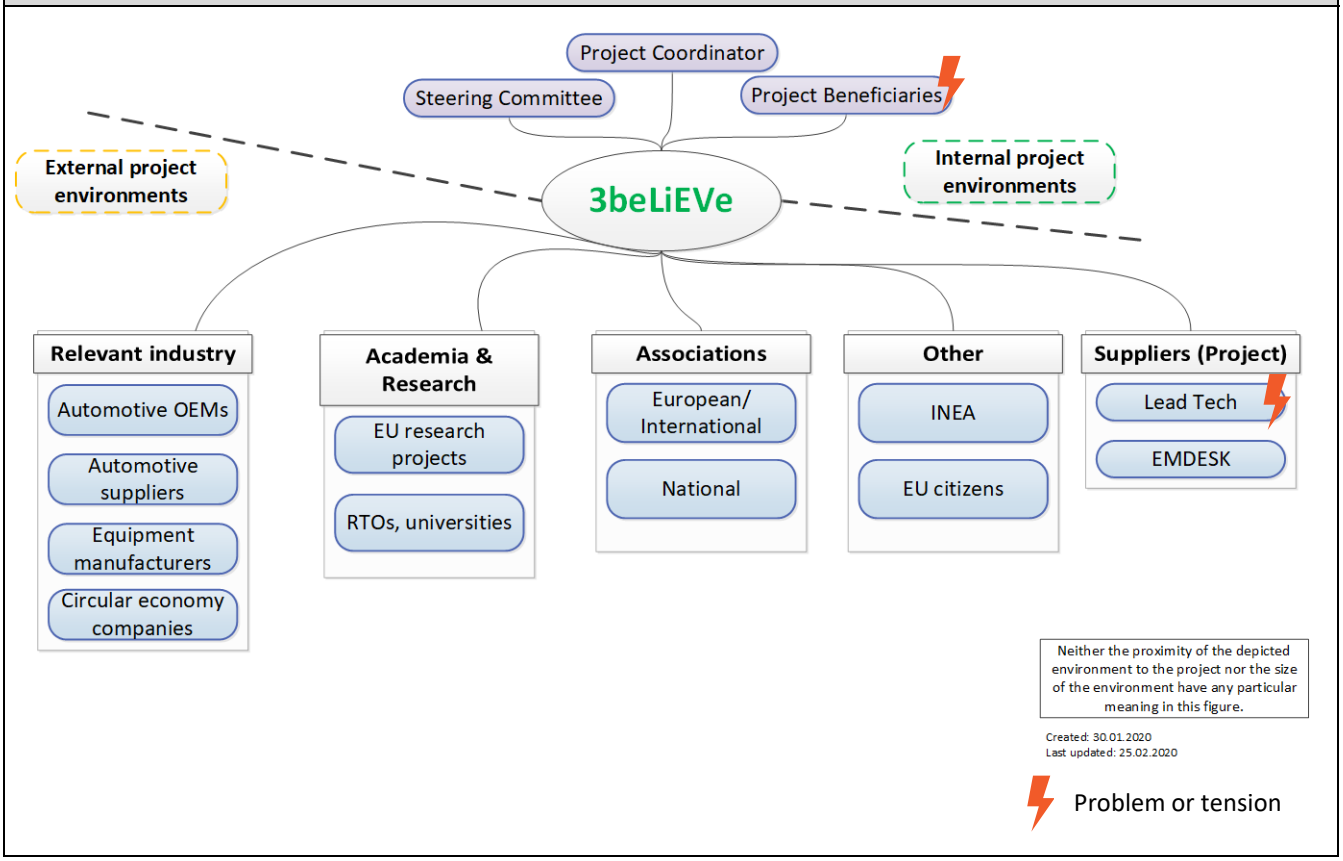
What will happen after the project has ended? (follow-up activities, further projects, …)?

- It is expected that beneficiaries will undertake to exploit the project results according to the Exploitation plan, which is encoded for 3beLiEVe in its deliverables D8.2 and D8.3
- Possibly: follow-up research and/or innovation projects, where some of the beneficiaries from the 3beLiEVe consortium collaborate in new constellations.

2.4. Project Environment Analysis

3beLiEVe
Grant Agreement 875033

PROJECT ENVIRONMENT GRAPHIC



3beLiEVe Grant Agreement 875033	**PROJECT ENVIRONMENT TABLE**		
Environment	**Relationship** (potential/conflict)	**Measures**	**Who / when** **PSP Code**
Internal project environments			
Project Beneficiaries 	These are the 21 partners executing the project. At present they are not individually depicted in the project environment graphic, but some or all members may be shown explicitly if/when particular relationships need to be depicted or examined more closely. At present, **(partner x)** has confirmed and **(partner y)** has indicated that Legal Entity changes might be necessary for the execution of the project. **(partner z)** indicates that prefinancing needed in order to make a purchase order for chips, otherwise a 6-month delay will result. Deadline: 27th April 2020. **(partner p)** (board) indicates that prefinancing needed by end of March or project activities will be suspended. **(partner k)** requests changes to the CA. **Operational capability of multiple 3beLiEVE beneficiaries is impacted due COVID-19 situation.**	Regular project communication and coordination. PC keeps all beneficiaries up to date on overall project status and progress, reviews updates from WP leaders. Prefinancing: consider preliminary payout even if remaining beneficiaries have not signed the CA yet? PC to reopen dialog with (partner k). For COVID-19: PC and SC are requesting updates to operational capability and impact on project from the beneficiaries involved in their WPs. PC reports to PO any significant changes.	PC 1.9.1, 1.9.2, 1.9.3
External project environments			
Academia & research	**LC-BAT-5-2019 projects**: These are other projects that, like 3beLiEVe, 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.).	3beLiEVe has a mandate to cluster with other relevant R&I projects (see T8.6). PC will get in touch with PCs of the other projects to initiate clustering activities.	PC, WP8-leader / within first 3 months of project start 1.8.6, 1.9.1

Associations	These formulate technology/R&D roadmaps and observe relevant projects in the domain of road transport research, relevant to projects like 3beLiEVe. Many members are automotive OEMs, which are relevant to 3beLiEVe for potential exploitation or dissemination of results.	Measures to reach these groups will be addressed in more detail as part of the Dissemination and Communication strategy (to be written in D8.1)	PC, WP8-leader, Project Beneficiaries 1.8.1, 1.8.2
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 3beLiEVe and handling the associated administrative/contractual aspects. Links to EC and European Parliament. **EU citizens -** Like all projects funded under the H2020 programme, 3beLiEVe has a contractual obligation to communicate the wider context and anticipated benefits of the project to EU citizens (taxpayers).	PC communication with PO; regular updates as needed. Communication to non-specialist audiences will be done as part of T8.2 using project website, social media and other collateral and according to the Dissemination and Communication plan (D8.1)	PC, WP8-leader, Project Beneficiaries 1.8.2
Lead Tech	Lead Tech is the company tasked with assisting 3beLiEVe with project branding and communication, including homepage implementation, setting up and operating social media channels, producing logo, document templates and newsletters. COVID-19: reduced ability to work (forced temporary layoff); results in slower delivery of contracted items.	Contact as needed to provide inputs for homepage updates and communication via the project's social media channels and newsletter.	Deputy PC, PC 1.8.2
EMDESK	Provider of the collaboration tool used to facilitate project coordination. The EMDESK platform serves as the central repository for project documentation.	Normally no regular interaction needed. Since the software is a beta version, users (particularly the PC) may from time to time file bug reports or feature requests.	PC, beneficiaries

In the project beneficiaries section of the above table, actual partner short names have been replaced with "partner .." to maintain confidentiality in this public version of the project handbook. The project internal version lists the actual short names.

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 3beLiEVe project proposal. Since the 3beLiEVe consortium comprises of 21 organizations, it is beyond the scope of this document to detail all the relationships of 3beLiEVe to other projects for each organization. Generally, it can be said that participation in 3beLiEVe 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 value chain for automotive batteries.

Furthermore, there is a relationship between 3beLiEVe and other projects funded under the same topic, this being *LC-BAT-5-2019 - Research and innovation for advanced Li-ion cells (generation 3b)*. These are requested by the funding agency to cluster and liaise with each other to exploit potential synergies. This activity is encapsulated for 3beLiEVe in *T8.6 Clustering and liaising with other relevant RDI projects and initiatives*. The other LC-BAT.5-2019 projects are COBRA and SeNSE.

2.6. Project Organisation

2.6.1. Project Consortium – List of beneficiaries

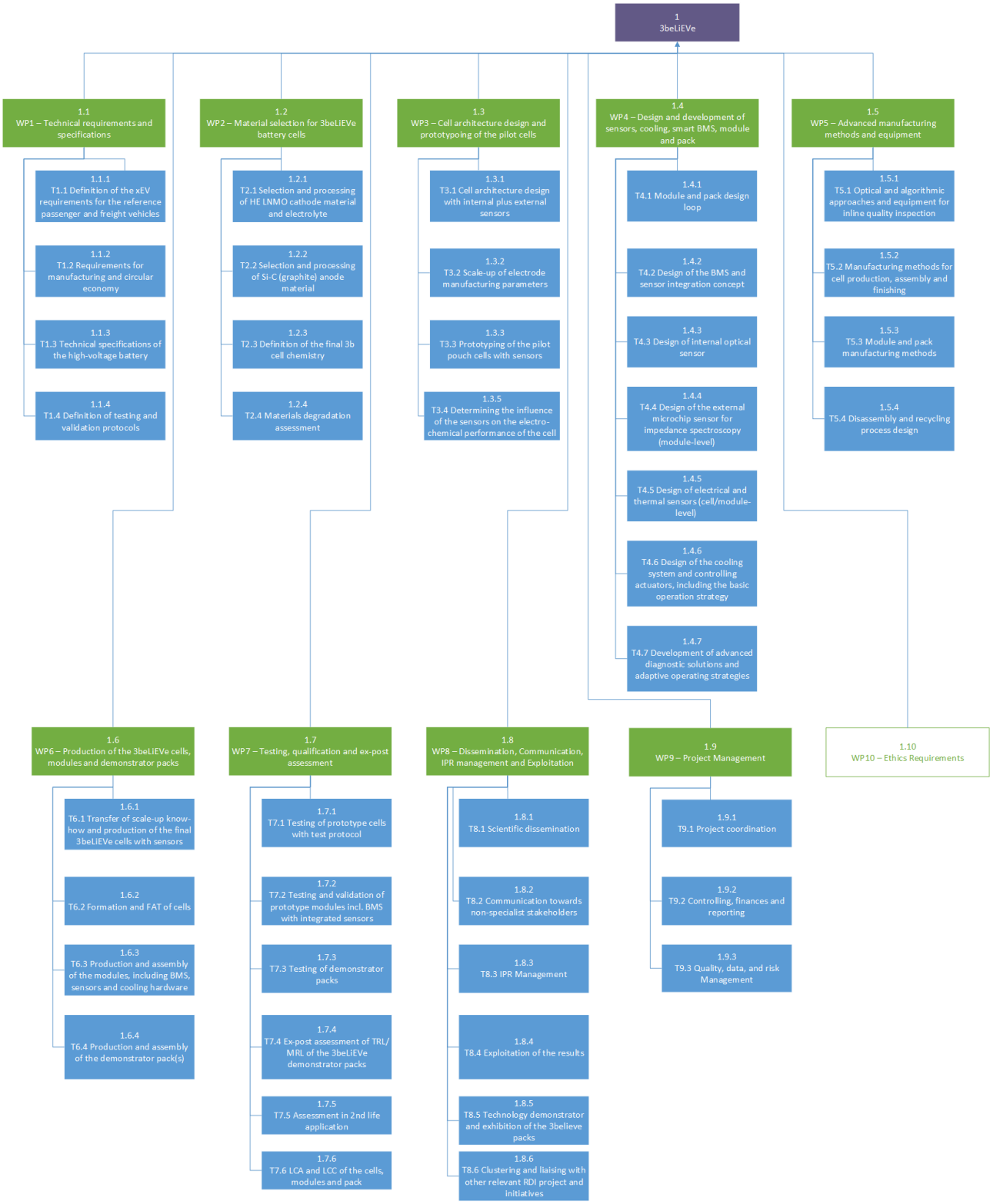
No.	Name	Short name in project	Country
1	AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH	AIT	Austria
2	CENTRO RICERCHE FIAT SCPA	CRF	Italy
3	DSM ENGINEERING PLASTICS BV	DEP	Netherlands
4	INSPLORION SENSOR SYSTEMS AB	INSP	Sweden
5	VALEO SYSTEMES THERMIQUES SAS	VLV	France
6	VALEO KLIMASYSTEME GMBH	VCC	Germany
7	CENTRO DE INVESTIGACION COOPERATIVA DE ENERGIAS ALTERNATIVAS FUNDACION, CIC ENERGIGUNE FUNDAZIOA	CICE	Spain
8	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	RWTH	Germany
9	CUSTOM CELLS ITZEHOE GMBH	CCI	Germany
10	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	FHG	Germany
11	NXP SEMICONDUCTORS FRANCE SAS	NXP	France
12	HALDOR TOPSOE AS	TOPSOE	Denmark
13	ELKEM AS	ELKEM	Norway
14	AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE	ENEA	Italy
15	SENSICHIPS SRL	SCP	Italy
16	AVESTA BATTERY & ENERGY ENGINEERING	ABEE	Belgium
17	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	CEA	France

18	MANZ ITALY SRL	MANZ	Italy
19	ARKEMA FRANCE SA	ARKEMA	France
20	VOLVO TECHNOLOGY AB	VOLVO	Sweden
21	SOCIETE NOUVELLE D'AFFINAGE DES METAUX-SNAM	SNAM	France

2.6.2. Project Organisation Chart

3beLiEVe Grant Agreement 875033	**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 Steering Committee and 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. Boschidar Ganev holds this role for AIT.
Deputy Coordinator (DC)	Support the Coordinator, particularly in technical issues; take over Coordinator tasks in case of illness/absence. This role was added after project start and is therefore not described in the CA.	Michele de Gennaro (AIT) is the DC.
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, WP7: Michele Gosso [CRF] WP2: Marine Reynaud [CICE] WP3: Marcus Jahn [AIT] WP4: Richard Cottet [VLV] WP5: Claudio Lanciotti [MIT] WP6: Christopher Wolter [CCI] WP8: Moritz Teuber [RWTH] WP9: Boschidar Ganev [AIT]
Steering Committee (SC)	Progress monitoring, GA support, controlling, preparing decisions for the GA. Meet 4x/year at minimum. Details are given in section 6 of the Consortium Agreement.	Consists of all WP-L, the DC and the PC.
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 EMDESK under 'Contacts', as well as in the mailing distribution list (cf. section

2.7. Work Breakdown Structure



2.8. Project Work-Package Specification

The work packages are detailed in the Grant Agreement for 3beLiEVe. They are also documented on the project document sharing platform, EMDESK, under 'Workplan', and on SyGMa (see Project Documentation, section 2.16.1).

2.9. Project Responsibility Matrix

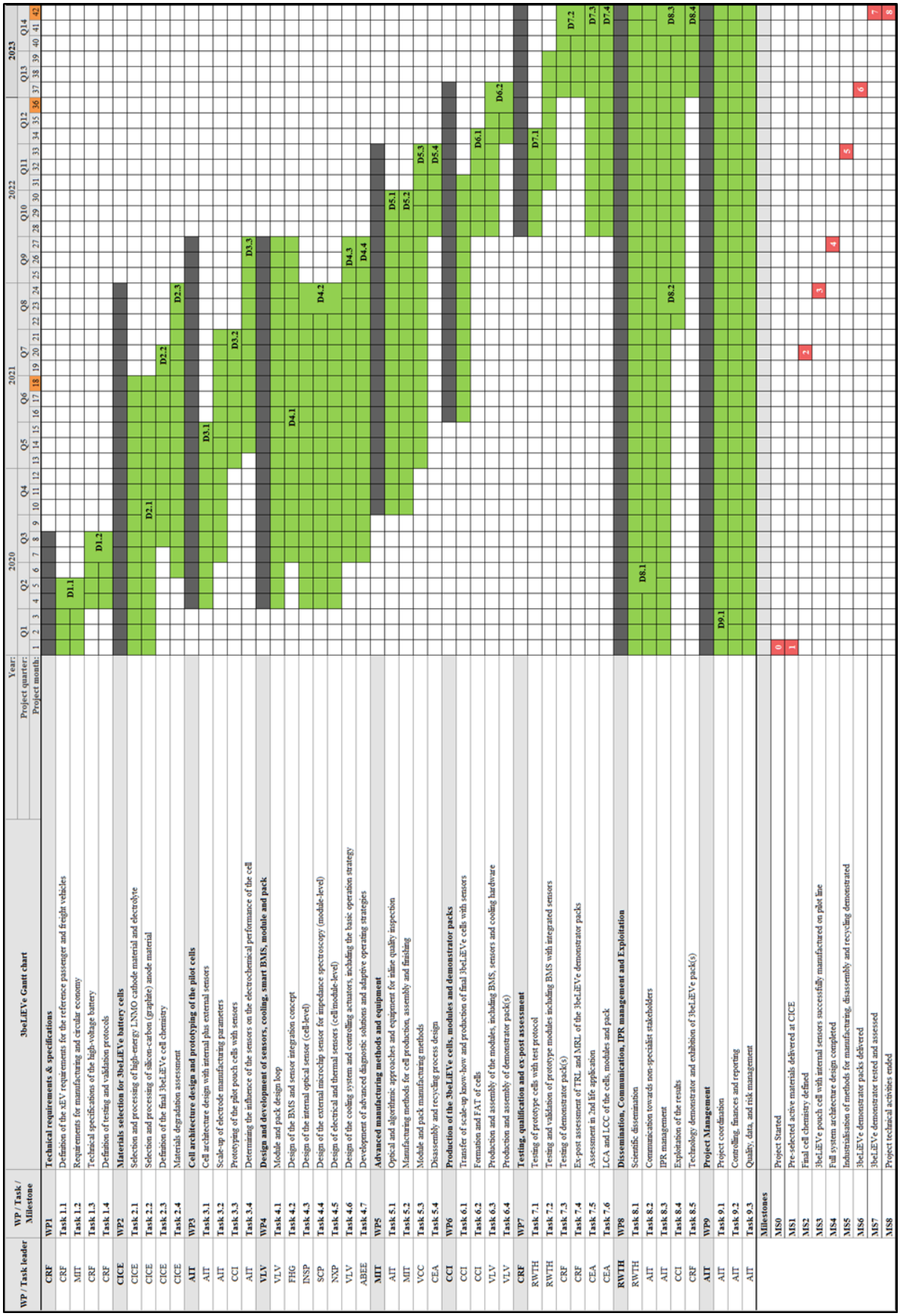
The following project responsibility matrix is given on an organization level, not on an individual project (team) member level, as the latter are too numerous to fit. Each project partner is responsible for allocating staff to cover the responsibilities in the project responsibility matrix. This matrix can be found on EMDESK under *Documents > WP9-Project Management > T9.1 Project Coordination*.

3beLiEVe		PROJECT RESPONSIBILITY MATRIX	1 (PC)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
PSP code	WP/ Task	R= Responsible; A=Approving; S=Supporting; I=Informed; C=Consulting	AIT	CRF	DEP	INSP	VLV	VCC	CICE	RWTH	CCI	FHG	NXP	HTAS	ELK	ENEA	SCP	ABEE	CEA	MIT	ARK	VOLVO	SNAM
1.1	WP1	**Technical requirements and specifications**		R				S	S	S	S	S						S	S	S		S	S
1.1.1	T1.1	Definition of the xEV requirements for the reference passenger and freight vehicles		R				S														S	
1.1.2	T1.2	Requirements for manufacturing and circular economy						S											S	R			S
1.1.3	T1.3	Technical specifications of the high-voltage battery		R				S	S		S	S						S					
1.1.4	T1.4	Definition of testing and validation protocols		R				S		S								S				S	
1.2	WP2	**Materials selection for 3beLiEVe battery cells**	S	S					R		S			S	S						S		
1.2.1	T2.1	Selection and processing of high-energy LNMO cathode material and electrolyte		S					R					S							S		
1.2.2	T2.2	Selection and processing of silicon-carbon (graphite) anode material		S					R						S						S		
1.2.3	T2.3	Definition of the final 3beLiEVe cell chemistry	S						R		S												
1.2.4	T2.4	Materials degradation assessment		S					R					S	S						S		
1.3	WP3	**Cell architecture design and prototyping of the pilot cells**	R			S	S	S	S		S		S	S			S			S			
1.3.1	T3.1	Cell architecture design with internal plus external sensors	R			S	S	S			S		S				S						
1.3.2	T3.2	Scale-up of electrode manufacturing parameters	R						S		S									S			
1.3.3	T3.3	Prototyping of the pilot pouch cells with sensors	S								R												
1.3.4	T3.4	Determining the influence of the sensors on the electrochemical performance of the c	R			S								S									
1.4	WP4	**Design and development of sensors, cooling, smart BMS, module and pack**	S	S	S	S	R	S			S	S	S			S	S	S					
1.4.1	T4.1	Module and pack design loop		S	S		R	S									S						
1.4.2	T4.2	Design of the BMS and sensor integration concept		S			S					R	S			S		S					
1.4.3	T4.3	Design of the internal optical sensor	S			R					S					S							
1.4.4	T4.4	Design of the external microchip sensor for impedance spectroscopy (module-level)		S												S	R						
1.4.5	T4.5	Design of electrical and thermal sensors (cell/module-level)		S			S					S	R			S							
1.4.6	T4.6	Design of the cooling system and controlling actuators, including the basic operation strategy		S			R					S											
1.4.7	T4.7	Development of advanced diagnostic solutions and adaptive operating strategies					S					S						R					
1.5	WP5	**Advanced manufacturing methods and equipment**	S		S			S			S								S	R			S
1.5.1	T5.1	Optical and algorithmic approaches and equipment for inline quality inspection	R																	S			
1.5.2	T5.2	Manufacturing methods for cell production, assembly and finishing	S					S			S									R			
1.5.3	T5.3	Module and pack manufacturing methods			S			R												S			
1.5.4	T5.4	Disassembly and recycling process design																	R	S			S
1.6	WP6	**Production of the 3beLiEVe cells, modules and demonstrator packs**	S		S	C	S	S	S	S	R	S	C				C			S			
1.6.1	T6.1	Transfer of scale-up know-how and production of final 3beLiEVe cells with sensors	S						S		R									S			
1.6.2	T6.2	Formation and FAT of cells	S						S		R												
1.6.3	T6.3	Production and assembly of the modules, including BMS, sensors, and cooling hardware			S		R	S		S		S											
1.6.4	T6.4	Production and assembly of the demonstrator pack(s)				C	R	S		C	C	C	C				C						
1.7	WP7	**Testing, qualification and ex-post assessment**	S	R					S	S	S							S	S			S	
1.7.1	T7.1	Testing of prototype cells with test protocol		S					S	R	S											S	
1.7.2	T7.2	Testing and validation of prototype modules including BMS with integrated sensors		S						R								S				S	
1.7.3	T7.3	Testing of demonstrator pack(s)	S	R																		S	
1.7.4	T7.4	Ex-post assessment of TRL and MRL of the 3beLiEVe demonstrator packs	S	R																		S	
1.7.5	T7.5	Assessment in 2nd life application																S	R				
1.7.6	T7.6	LCA and LCC of the cells, modules and pack		S															R				
1.8	WP8	**Dissemination, Communication, IPR management and Exploitation**	S	S	S	S	S	S	S	R	S	S	S	S	S	S	S	S	S	S	S	S	S
1.8.1	T8.1	Scientific dissemination	S						S	R		S				S			S				
1.8.2	T8.2	Communication towards non-specialist stakeholders	R																				
1.8.3	T8.3	IPR Management	R																				
1.8.4	T8.4	Exploitation of the results		S	S	S	S	S			R		S	S	S		S	S		S	S	S	S
1.8.5	T8.5	Technology demonstrator and exhibition of the 3beLiEVe packs	S	R																		S	
1.8.6	T8.6	Clustering and liaising with other relevant RDI projects and initiatives	R							S													
1.9	WP9	**Project Management**	R	S			S		S		S									S			
1.9.1	T9.1	Project coordination	R																				
1.9.2	T9.2	Controlling, finances and reporting	R	S			S		S		S									S			
1.9.3	T9.3	Quality, data, and risk management	R	S			S		S		S									S			
1.10	WP10	**Ethics**	R																				

2.10. Milestone plan

#	Milestone title	WP #	Lead beneficiary	Due Date (in months)	Means of verification
MS1	Project started	WP9	1 – AIT	1	Verification: Project M1 has begun; Kick-Off Meeting held (evidenced by Minutes of Meeting).
MS2	Pre-selected active materials delivered at CICE	WP2	7 – CICE	1	Verification: Pre-selected batches of LNMO, graphite/ silicon and electrolyte have arrived at CICE.
MS3	Final cell chemistry defined	WP2	7 – CICE	20	Verification: D2.2 delivered.
MS4	3beLiEVe pouch cell with internal sensors successfully Manufactured on pilot line	WP3	1 – AIT	24	Verification: D3.2 and D4.2 delivered.
MS5	Full system architecture design completed	WP4	5 – VLV	27	Verification: D4.1, D4.2 and D4.3 delivered.
MS6	Industrialisation of methods for manufacturing, disassembly and recycling demonstrated	WP5	18 – MANZ	33	Verification: D5.2, D5.3 and D5.4 delivered.
MS7	3beLiEVe demonstrator packs delivered	WP6	9 – CCI	37	Verification: Physical demonstrators available; D6.2 delivered.
MS8	3beLiEVe demonstrator tested and assessed	WP7	2 – CRF	42	Verification: D7.2 and D7.3 delivered.
MS9	Project technical activities ended	WP9	1 – AIT	42	Verification: M42 ended and final project 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 person-month resources are also given on EMDESK, under 'Resources'.

The **project cost plan** is given in Annex 2 of the Grant Agreement and is not reproduced here for reasons of confidentiality. A high-level summary of the project costs is given in section 2.1. Total funding and funding per beneficiary can also be viewed in the public records: https://cordis.europa.eu/project/id/875033.

2.13. Project Communication (Internal)

This section and its subsections document communication structures and tools inside the project organisation (internal communication). For external communication, please see section 4.2.

3beLiEVe 875033	PROJECT-COMMUNICATION			
Title	**Objectives, Content**	**Participants**	**Schedule**	**Location**
Project plenary telephone conference	• General project status update • Exchange between WPs • Communicate issues, needs	All	1x /month	Telco service (gotomeeting)
Project Steering Committee meeting	• Project status • Controlling of tasks, schedule, resources, costs • Controlling of project environments • Prepare any proposals for decision by GA • Update project handbook	Project Coordinator, Deputy Coordinator, WP leaders	4x /year	Telco service or in person
WP meetings	• Coordination of WP or task • Discussion of technical progress, issues, next steps	Members of each WP	Usually once per two weeks, or as arranged by WP leader	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	2x /year	In-person at a different project partner location
Project Review Meetings with PO	• Report and review project progress	PC, WP leaders	After M18, after M30, at or after M42 – 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. Email distribution lists

Day to day project communication is generally done by email. An email distribution list has been set up for each WP. In this way, all members of a particular distribution list can be easily contacted by simply addressing an email to that list. The list for WP8 can be used to contact all project participants. The available lists can be viewed at the project document repository (EMDESK), under 'Groups' – each group has an email address. Furthermore, the membership for each distribution list is documented in the file *3beLiEVe Responsibility Matrix + Mailing Lists.xlsx*, in the Mailing List worksheet. This is located in EMDESK > *Documents* > *WP9* > *T9.1.*

2.13.2. Teleconferencing tools

The PC provides a teleconferencing tool (gotomeeting) 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 EMDESK collaboration platform • Use the 'versioning' functionality of EMDESK to avoid a large clutter of different versions of the same document • Don't send large attachments by email – store them on EMDESK 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 EMDESK 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 WP8 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 (cf. section 4.3.2)

2.15. Project Risk Analysis

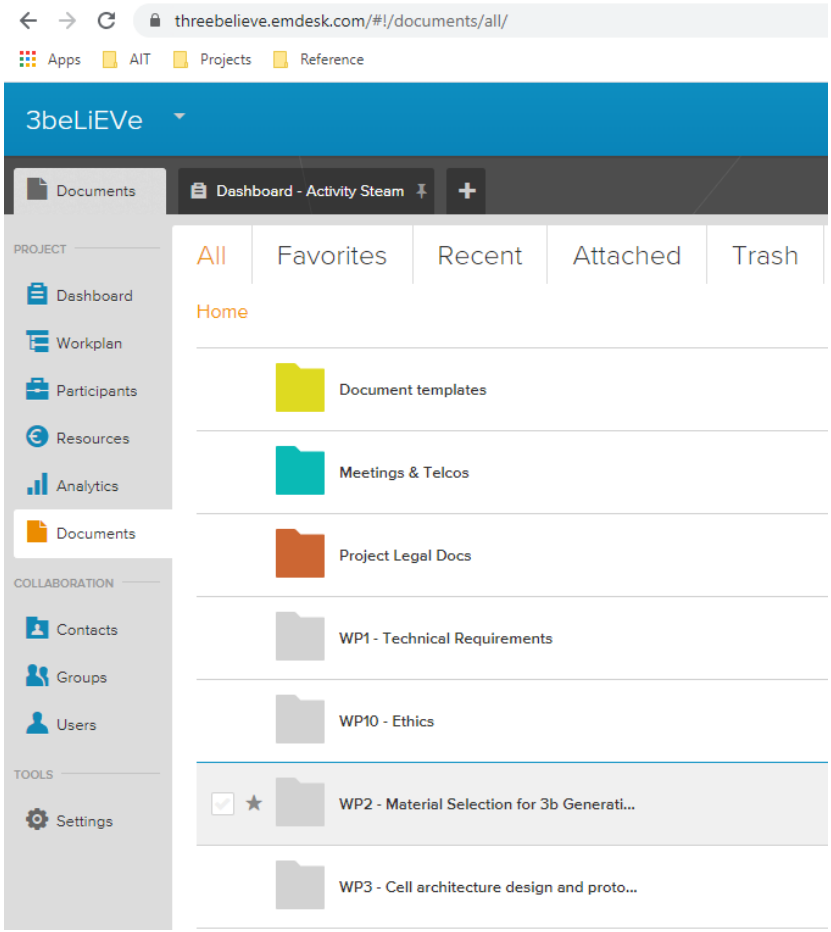
Risk #	Description of risk	WP Number	Proposed risk-mitigation measures
1	Insufficient communication and coordination between partners.	All WPs	Mutual exchange of information between partners and work packages is indispensable for the success of 3beLiEVe. This is ensured by the project management processes (T9.1), e.g. by holding regular plenary telephone conferences, General Assembly and WP meetings, as well as risk review meetings of the SC. Moreover, a project culture of cooperation and transparency in all actions will be encouraged and supported through IT tools.
2	Consolidation of the technical requirements reveals that some of them are mutually exclusive.	WP1	Requirements and specifications will be analysed in detail and, should contradictory sets of requirements emerge, they will be prioritised in consultation with WP1 leader and, if needed, with the Project Officer.
3	Satisfactory cell chemistry harmonization cannot be achieved, e.g. cathode/anode/ electrolyte combination exhibits unwanted side effects such as gas formation (WP2).	WP2	HTAS, ELK and ARK have already experience regarding compatibility of their materials from previous project and a compatibility check has been done at proposal preparation phase. Moreover, at the beginning of the project, each material supplier will provide two-to-three variations of the material, increasing the chance of having favourable combinations in line with the KPIs of Table 2. For current collector corrosion, the following mitigation measures are envisaged: 1. If electrolyte additives trailed in-project (WP2) do not prove effective, resources could be re- allocated to subcontracting (in agreement with the Project Officer) to a university spin-off that specialises in additives and is known to one of the project partners. The specialist will perform rapid iterative steps with different additives. This risk mitigation measure would be invoked only if the in-project measures are not successful. 2. If carbon-coated foils are not sufficiently effective against current collector corrosion, Al- current collectors treated in aluminium-phosphate solution can be employed. This can be trialed on a lab-scale in-project. However, if large-scale treatment (hundreds of meters of foil) becomes necessary, a company capable of performing this would need to be found. This would also require the re-allocation of some funds to subcontracting, again after prior consultation with the PO.

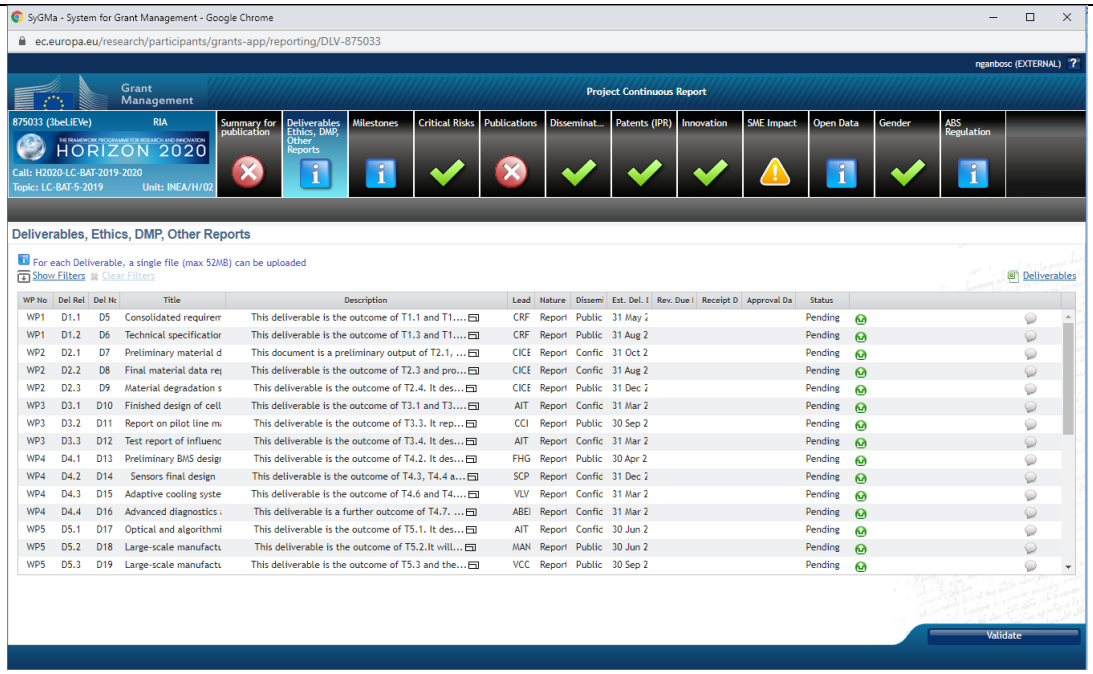
4	Aqueous slurry formulation for LNMO cathode is intractable (WP2).	WP2	3beLiEVe aims to utilise water-processable slurries for both electrodes. As a risk mitigating measure, NMP-based processing routes will be studied in parallel during WP2, so they are available in case they should be needed.
5	Production method for cells with internal sensors on pilot plant is not workable.	WP3, WP4	If semi-automated production processes prove not to be feasible, the sensors will be incorporated in a fully manual process. In a worst case, only a small subset of the final prototypes will feature the internal sensors, keeping in mind there are still two sets of external sensors available.
6	Use of overmoulding technique to mould parts of the module enclosure onto/ over the cells not workable.	WP4	A more traditional, tried and tested process will be used instead of overmoulding, and/or a different module design approach will be employed. Functionality of the cooling system and the BMS will be preserved.
7	Not all steps in the manufacturing process for 3beLiEVe demonstrators can be shown to work at gigafactory level.	WP5	The intractable steps will be identified and described in D5.1 or D5.2, depending on whether the gap manifests at cell or module/pack level. Appropriate recommendations will be made for overcoming these bottle necks.
8	Manufacturability of the 250 cells for the battery demonstrators at CCI is not feasible.	WP6	Manufacturability of the final cell design is ensured at CCI, with main design choices already presented at proposal level (e.g. 301.5×99.7×6.7 mm pouch format). In case problems arise at CCI, the battery cell pilot line operated from AIT can cover this role.
9	Delays in upstream activities lead to insufficient time for complete testing.	WP7	Project has been planned for a 42-month duration to allow sufficient time for testing and unanticipated delays. In case of insufficient time for complete testing, SC and GA will prioritize testing activities with a view to obtaining maximum results in the available time.
10	Insufficient resources.	All WPs	While efforts have been made to correctly budget the project, unexpected difficulties might arise. They will be identified as quickly as possible through the project and risk management processes. The SC will propose solutions to emerging resource challenges, if necessary, in consultation with the Project Officer.
11	Partner leaves consortium, due to insolvency or other reasons (all WPs).	All WPs	This risk is limited as most partners have a successful track record as project partners. However, SME partners are at most economic risk and 3beLiEVe includes three SMEs (INSP, SNC and ABEE). In case one of these SMEs or a partner, in general, leaves the consortium, affected tasks will be transferred to other partners (e.g., the five RTOs onboard have expertise in several areas and can fill the possible gaps). In-built redundancies have been planned for this purpose as a risk mitigation measure.

12	Upscaled production costs of electrolyte are incompatible with the cost target on cell or pack level (e.g. due to cost of high purity LiFSI salts).	WP2, WP5, WP7	The only risk Arkema envisions for the moment is a risk associated with a too high production cost, only computable precisely at the TRL 6 level. All technical issues can be overcome. If LiFSI production cost is too high compared to market expectations, Arkema will study, develop and provide 5V stable formulations with the minimum LiFSI necessary amount in combination with other salts and additives.

2.16. Project Documentation

2.16.1. Document repositories

Area	Description
Files	**EMDESK** (https://threebelieve.emdesk.com) is the repository for project documentation. In the 'Documents' section, there is a folder for each WP. Files belonging to that WP should be placed in that 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	**EMDESK**
	• PC is the Admin for EMDESK with all corresponding rights
	• Deputy PC is Manager for EMDESK with all corresponding rights
	• All other users have access rights for the different EMDESK resources as follows:
	  ○ Activities: regular users can Edit All
	  ○ Participants: regular users can Read All
	  ○ Documents: regular users can Manage All
	  ○ Resources: regular users can Read All
	
	Manage = Edit & Manage (Add, Move and Delete) access
	Edit = Edit access but no Manage (Add, Move, and Delete)
	Read All = Read access but no Edit right
	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. *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 or the Deputy PC. • Status setting for deliverables, tasks and work packages (in EMDESK 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

ID	Name	Responsible (Owner)	Reviewer	Due date	Calendar due date	Dissemination Level
D 1.1	Consolidated requirements for the 3beLiEVe battery pack	P 2 - CRF	WP2-tbd	M05	31.05.2020	Public
D 1.2	Technical specifications and test protocols for the battery	P 2 - CRF	WP2-tbd	M08	31.08.2020	Public
D 2.1	Preliminary material data report (electrode components and processing)	P 7 - CICE	WP3-tbd	M10	31.10.2020	Confidential
D 2.2	Final material data report and definition of final 3beLiEVe cell chemistry	P 7 - CICE	WP3-tbd	M20	31.08.2021	Confidential
D 2.3	Material degradation study	P 7 - CICE	WP3-tbd	M24	31.12.2021	Public
D 3.1	Finished design of cells with internal and external sensors	P 1 - AIT	WP4-tbd	M15	31.03.2021	Confidential
D 3.2	Report on pilot line manufacturing process and parameters for prototype cells	P 9 - CCI	WP5-tbd	M21	30.09.2021	Public
D 3.3	Test report of influence of internal sensor on performance and degradation	P 1 - AIT	WP4-tbd	M27	31.03.2022	Confidential
D 4.1	Preliminary BMS design and sensor integration concept	P 10 - FHG	WP5-tbd	M16	30.04.2021	Public
D 4.2	Sensors final design	P 15 - SCP	WP5-tbd	M24	31.12.2021	Confidential
D 4.3	Adaptive cooling systems and final BMS design	P 5 - VLV	WP5-tbd	M27	31.03.2022	Confidential
D 4.4	Advanced diagnostics and adaptive operating strategy using machine learning	P 16 - ABEE	WP5-tbd	M27	31.03.2022	Confidential
D 5.1	Optical and algorithmic approach for inline quality inspection	P 1 - AIT	WP6-tbd	M30	30.06.2022	Confidential
D 5.2	Large-scale manufacturing for 3beLiEVe cells	P 18 - MANZ	WP6-tbd	M30	30.06.2022	Public
D 5.3	Large-scale manufacturing for modules and packs	P 6 - VCC	WP6-tbd	M33	30.09.2022	Public
D 5.4	Disassembly and recycling processes	P 17 - CEA	WP6-tbd	M33	30.09.2022	Public
D 6.1	FAT report on prototyped cells	P 9 - CCI	WP7-tbd	M34	31.10.2022	Public
D 6.2	Final design and specifications of module and pack	P 5 - VLV	WP7-tbd	M37	31.01.2023	Public
D 7.1	Test report on prototype cells including baseline data	P 8 - RWTH	WP8-tbd	M34	31.10.2022	Public
D 7.2	Test report of demonstrator packs	P 2 - CRF	WP8-tbd	M42	30.06.2023	Public
D 7.3	2nd life demonstration and modelling	P 17 - CEA	WP8-tbd	M42	30.06.2023	Public
D 7.4	Ex-post assessment report, including LCA/LCC	P 17 - CEA	WP8-tbd	M42	30.06.2023	Public
D 8.1	Dissemination and communication plan	P 8 - RWTH	WP9: VLV	M06	30.06.2020	Public
D 8.2	Interim IPR report, exploitation strategy and business cases	P 9 - CCI	WP9: CRF	M24	31.12.2021	Public

D 8.3	Final IPR report and exploitation strategy after 3bELiEVe	P 2 - CRF	WP9: AIT	M42	30.06.2023	Public
D 8.4	Final dissemination report	P 8 - RWTH	WP9: MIT	M42	30.06.2023	Public
D 9.1	Project Management Handbook	P 1 - AIT	Steering Committee (all)	M03	31.03.2020	Public
D 9.2	Data Management Plan	P 1 - AIT	Steering Committee (all)	M06	30.06.2020	Public,ORDP
D 10.1	NEC - Requirement No. 1	P 1 - AIT	ELKEM	M03	31.03.2020	Confidential
D 10.2	EPQ - Requirement No. 2	P 1 - AIT	AIT	M12	31.12.2020	Confidential
D 10.3	EPQ - Requirement No. 3	P 1 - AIT	AIT	M18	30.06.2021	Confidential
D 10.4	EPQ - Requirement No. 4	P 1 - AIT	AIT	M03	31.03.2020	Confidential

Where reviewers for a deliverable have not been defined yet ("…tbd"), these will be defined either in the next iterfation of this project handbook, or when the drafting of the deliverable begins, whichever occurs first.

3. Project Start

3.1. Minutes – Project Start

The technical project start for 3beLiEVe was on 1.1.2020. The project kick-off meeting, which represents the actual start, successfully took place on 14th, 15th and 16th January 2020 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 *Documents > Meetings & Telcos*. With the completion of the kick-off meeting, *MS1 Project started* was achieved (cf. section 2.10).

3.2. Follow-up Workshop

A follow-up workshop to the kick-off meeting was not held. The work packages WP1, WP2, WP8 and WP9 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 EMDESK document sharing platform. Minutes from plenary telecalls and General Assemblies are placed in the 'Documents' section under *Meetings & Telcos.* 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 WP8. For external communication, the measures will be developed and executed in *T8.2 Communication towards non-specialist stakeholders*. T8.2 is under responsibility of AIT and carried out with the support of a subcontractor selected through a competitive procedure. Hereunder the main steps of the procedure:

- 10th Dec. 2019: invitation to bid distributed to three companies;
- 17th Dec. 2019: deadline for issuing questions on the invitation to bid. Replies finalised by AIT and distributed to the three companies on the same day;
- 12th Jan. 2020: deadline for presenting the bids;
- 23rd Jan. 2020: communication of the successful selection to Lead Tech and beginning of the negotiation phase;
- Feb. 2020: issue of the subcontract to Lead Tech (for a value of 32,000 EUR) and communication of the negative outcome of the selection to the other two contenders.

All communications have been issues via mail (DC, with Coordinator in CC), and the selection carried out on the sole basis of lowest price (i.e. best value for money, according to the "Main procurement rules for the award of implementing contracts and subcontracting" of the H2020 Financial Guidelines for Applications Action Grants, April 2019).

A project website will be set up at the domain www.3believe.eu with a redirect to that same domain from www.3believe-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 stakeholders (for these, see section **Fehler! Verweisquelle konnte nicht gefunden werden.** (external environments). The communication strategy will be documented in *D8.1 dissemination and communication plan*.

Furthermore, for reasons of quality assurance and IPR/confidentiality, it is important to follow the approval procedures for external communication. See →section 4.2

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 3beLiEVe 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 INEA.

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. The relevant passages are rendered again here for easy reference, with emphasis added in bold for key passages.

8.4 Dissemination

***Prior notice of any planned publication shall be given to the other Parties at least 60 calendar days before the publication**. **Any objection to the planned publication shall be made** in accordance with the Grant Agreement in writing to the Coordinator and to the Party or Parties proposing the dissemination **within 45 calendar days after receipt of the notice**. If no objection is made within the time limit stated above, the publication is permitted.*

8.4.1 For the avoidance of doubt, nothing in Section 8.4 has an impact on the confidentiality obligations set out in Section 10.

8.4.2.2 An objection is justified if
(a) the protection of the objecting Party's Results or Background would be adversely affected
(b) the objecting Party's legitimate interests in relation to the Results or Background would be significantly harmed.
The objection has to include a precise request for necessary modifications.

8.4.2.3 If an objection has been raised the involved Parties shall discuss how to overcome the justified grounds for the objection on a timely basis (for example by amendment to the planned publication and/or by

protecting information before publication) and the objecting Party shall not unreasonably continue the opposition if appropriate measures are taken following the discussion.

8.4.2.4 ***The objecting Party can request a publication delay of not more than 60 calendar days from the time it raises such an objection****. After 60 calendar days the publication is permitted provided that Confidential Information, Background or Results of the objecting Party has been removed from the Publication as indicated by the objecting Party.*

8.4.3 Dissemination of another Party's unpublished Results or Background

A Party shall not include in any dissemination activity another Party's Results or Background without obtaining the owning Party's prior written approval, unless they are already published.

The mere absence of an objection according to 8.4.2.1.is not to be interpreted as an approval according to the above. In case the Results and/or Background are amalgamated in such a way that the ownership of these Results and/or Background cannot be ascertained the publishing Party shall include this information in the notice of Section 8.4.2.1.

4.3.3. Register of dissemination and communication measures

Dissemination and communication are part of the contractual obligations of every H2020-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 EMDESK under *Documents > WP8 > T8.1*. The task leader for T8.1 is responsible for maintaining the list.

4.3.4. Periodic reporting

The H2020 Online Manual gives an overview of the structure and content of periodic reports here: https://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/reports_en.htm#periodic-report. Periodic reporting must be performed after the end of each Reporting Period (RP).

There are three RPs in 3beLiEVe:

- Reporting Period 1 (RP1): M1-M18 (January 2020 – June 2021)
- Reporting Period 2 (RP2): M19-M30 (July 2021 – June 2022)
- Reporting Period 3 (RP3): M31-M42 (July 2022 – June 2023).
-

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 → Steering Committee → General Assembly → Issue resolution according to CA.

4.4. Data management

3beLiEVe is opted in to the European Commission's Open Research Data Pilot (ORDP). As part of this, 3beLiEVe will produce a Data Management Plan (DMP), which will we documented in *D9.2 Data Management Plan*. The Horizon 2020 Online Manual[1] gives the following general definition of a DMP:

Data Management Plans (DMPs) are a key element of good data management. A DMP describes the data management life cycle for the data to be collected, processed and/or generated by a Horizon 2020 project. As part of making research data findable, accessible, interoperable and re-usable (FAIR), a DMP should include information on:

- *the handling of research data during & after the end of the project*
- *what data will be collected, processed and/or generated*
- *which methodology & standards will be applied*
- *whether data will be shared/made open access and*
- *how data will be curated & preserved (including after the end of the project).*

A DMP is required for all projects participating in the extended ORD pilot, unless they opt out of the ORD pilot.

[…]

The ORD pilot applies primarily to the data needed to validate the results presented in scientific publications. Other data can also be provided by the beneficiaries on a voluntary basis, as stated in their Data Management Plans. Costs associated with open access to research data, can be claimed as eligible costs of any Horizon 2020 grant.

[1] https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/data-management_en.htm

4.5. Quality

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

- no confidential or other restricted 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 confidential (cf. section 2.16.2).

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" (→ section 4.3.1). The deliverable…

- uses the current project template, if applicable (location: EMDESK → *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 has received funding from the European Union's H2020 research and innovation programme under Grant Agreement no. 875033."

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/sites/info/files/use-emblem_en.pdf.

Deliverables should include this disclaimer:

"This publication reflects only the author's view. The European Commission and the Innovation and Network Agency (INEA) are not responsible for any use that may be made of the information it contains."

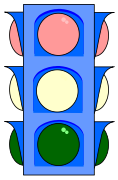
5. Project Controlling

Project controlling is done periodically by the Steering Committee as part of its regular meetings (Project Steering Committee meeting → cf. section 2.13). The SC performs 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)
- The PC issues an updated version of this project handbook
- The PC updates, if applicable, the Risks section in SyGMa.

5.1. Project Status Report

3beLiEVe 875033	PROJECT STATUS REPORT as of **23.3.2020**
 Project crisis Project in difficulties Project according to plan ✓	**1) Overall Status:** • Project on schedule so far. No major impact due to Coronavirus situation yet; this may change in the near future. • CA signatures and prefinancing payout needs to be resolved to avoid future problems. Solution to (partner k) position on CA needs to be found. • An amendment will likely be needed before end of RP1 (due to LE udpates).
2) Status Project objectives • Unchanged	**Activities:** • None required
3) Status Project progress • WP1: Vehicle requirements largely gathered; 2nd life use case selected. D1.1 draft to start shortly. WP on track; work possible from home. • WP2: Ongoing materials selection and testing. WP on track, after small delay in receiving materials at the start. Currently not delayed by corona situation; some people still in lab. Waiting for LNMO batch 3 to arrive. • WP8: Project logo and doc template delivered; stakeholder categories defined. WP on track. • WP9: ongoing coordination. WP on track.	**Activities:** • **WP leaders to review current and expected operational capabilities of 3beLiEVe beneficiaries due to COVID19 pandemic as part of their WP calls**. • WP1, WP2, WP8, WP9: continue as per work plan. • Start drafting D1.1 and D8.1. • Cross-cutting topic of data management plan to be addressed in the near future. PC to issue information and proposal as a starting point.
4) Status Schedule • **WP1:** On time. • **WP2:** On time. • **WP3:** WP kickoff at start of April in planning. No immediate delay. • **WP4:** WP kickoff at start of April in planning. • **WP8:** On time. • **WP9:** On time.	**Activities:** • WP leaders are planning kick-off telcos for WP3 and WP4. • WP3/WP4 technical discussion and synchronization to be a focus at GA meeting in July.

5) Status Resources/costs • Prefinancing still not paid out because not all CA signatures received. Post-meeting update: (partner k) has indicated inability to sign current CA version due to status of affiliated entities. • (partner) Board requires prefinancing by end of March 2020 or else will suspend activities • (partner) requires prefinancing by April 27th to place orders, otherwise major delays • Resource/cost consumption: no status so far - next update as part of perioding reporting for RP1	**Activities:** • (partner), (partner) need to sign CA. Decision: PC to chase signatures and set deadline end of CW13. Update: need to find solution for (partner) situation. • SC will reevaluate CA/prefinancing payout situation after deadline of 27.3.2020.
6) Status Context (incl. other projects, e.g. LC-BAT-5) • Clustering activity (T8.6) with LC-BAT-5 projects to be initiated	**Activities:** • PC to contact SeNSE and COBRA coordinators – estimate mid- to end of April.
7) Status Organisation/culture (incl. LE topics, partner participation) • **WP1 leader must suspend all activities (government decree in Italy) due to COVID19 until 27th March. (partner) operations also closed; activity suspended until April 10th. Limited remote work. (partner): no work allowed until May 4th.** • Legal Entity adjustment required for (partner). • LEGAL Entity adjustment potentially required for (partner); Two other partners are checking budget split. No change to technical commitments. • GA meeting in July questionable due to COVID19 situation.	**Activities:** • PC will take charge of WP1 lead until leader can operate again. • (partner) & (partner) to confirm needed legal entity/budget adjustments, if any (next month?) • PC to notify PO of needed amendment once full set of needed changes is established • PC issue information to consortium about GA meeting and business travel (info from PO).

In the above table, actual partner short names have been replaced with “partner ..” to maintain confidentiality in this public version of the project handbook. The project internal version lists the actual short names.

5.2. Additional Project Status Reports

None at present. Reports from review meetings with the PO may be included here.

5.3. Minutes – Project Controlling

Minutes of meeting for project controlling will be saved at EMDESK > *Documents* > *WP9* > *WP9 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 Close Down

To be written after close down event.

7. Conclusions

This project management handbook outlines the project plans for 3beLiEVe 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 3beLiEVe project. It is a living document and will be updated as part of regular project controlling.

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