



Halide solid state
batteries for **EL**ectric
vEhicles **aNd** **A**ircraft

**DELIVERABLE 1.1 - PROJECT MANAGEMENT
HANDBOOK**



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Publishable summary

The aim of this document is to specify the procedures for technical and financial reporting, the presentation standards for deliverables and reports to the EC, the measures to ensure timely reporting and the internal review procedure to guarantee the quality of the results. Therefore, this deliverable will provide a common HELENA project management guide to all members of the consortium. The procedures contained in this guide will ensure the efficiency and final quality of the deliverables and will reduce the risk of the project.

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1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The aim of this document is to provide an overview of the operating procedures for the HELENA project management, including the rules and responsibilities of the signatory parties of the Grant Agreement (GA) and Consortium Agreement (CA), ensuring excellent quality and progress of the activities carried out.

These operating procedures are a management tool and summarizes all the required knowledge for the good management of the documentation of the project to ensure the efficiently progress of the activities; and contains useful information to project partners to perform their tasks and guarantee the quality of the results of the project. Furthermore, the guide also clarifies legal and financial aspects of the GA and CA that need further explanations to beneficiaries.

This guide is a “living” document and can be modified according to the project needs. It will be also updated and extended, if needed, through the project lifecycle including relevant issues and changes in the project or procedures and informing all the partners about any change made with respect to the previous version.

1.2 RELATION TO OTHER PROJECT DOCUMENTS

In the event of discrepancy between documents, this Project Management Handbook is overruled by the Grant Agreement including its Annexes and the Consortium Agreement.

1.3 ABBREVIATIONS LIST

Table 1. Abbreviation list

Project Management Handbook	PMH
Grant Agreement	GA
Consortium Agreement	CA
European Commission	EC
Project Coordinator	CO
Work Package	WP
Data Management Plan	DMP
Project Coordinator	PC
General Assembly	GAS
Work Package Leader Board	WPLB
Exploitation Manager	EM

2 PROJECT BASIS

2.1 PARTICIPANT LIST

The beneficiaries of the HELENA project are listed in the Grant Agreement, in the Consortium Agreement, and present in the list below:

Table 2: Participant list

Participant organization number & name	Participant short name	Country
1 (CO)- Centro de Investigación Cooperativa de Energías Alternativas Fundación	CICE	ES
2- Austrian Institute of Technology GmbH	AIT	AUT
3- Saint-Gobain Recherche SA	SGR	FR
4- Umicore NV	UMI	BE
5- LionVolt	LV	NL
6- Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek	TNO	NL
7- Fraunhofer Institute for Surface Engineering and Thin Films	FHG	DE
8- Customcells Holding GmbH	CCI	DE
9- Rheinisch Westfälische Technische Hochschule Aachen	RWTH	DE
10- Mimatech GmbH	MIMI	DE
11- IFP Energies Nouvelles	IFPEN	FR
12- Pipistrel aircraft	PVS	SI
13- Leonardo SPA	LDO	IT
14- FEV Europe GmbH	FEV	DE
<i>14.1- FEV eDLP GmbH</i>	EDLP	DE
15- Zabala Innovation Consulting SA	ZAB	ES

A project contact list of the project participants has been created at the beginning of the project. It is being updated continuously and is available in the project repository.

2.2 CONTRACTUAL DOCUMENTS

The management structure of the HELENA project is covered in full detail in the contractual documents explained in the following sub-sections:

2.2.1 Grant Agreement

The Grant Agreement with the EC: EC-GA Nb. 101069681 is the contractual document signed by all project partners which defines the rights and obligations of the consortium with the European Commission. The EC-GA includes the following annexes:

- **Annex 1: Description of the Action**, which describes the work to be performed by the project consortium.
- **Annex 2: Estimated budget for the action**, which describes the general budget and every partner's budget per cost category.
- **Annex 2a: Additional information on unit costs and contributions**
- **Annex 3: Accession form for beneficiaries**
- **Annex 5: Specific rules**

2.2.2 Consortium Agreement

The Consortium Agreement (CA) is the internal contract of the consortium partners which has been signed and accepted by all partners. It defines the consortium internal rules for

project management as well as the consortium organisation and decision-making mechanisms. In case of discrepancy, the CA is overruled by the EC-GA.

3 PROJECT STRUCTURE

The overall plan of the project that is expected to be carried out follows the tasks, activities, schedule and budget defined in the GA (Annex I – Description of the Action).

The project and work structure are mainly defined by the project WPs, deliverables and milestones.

3.1 WORK PACKAGE STRUCTURE

HELENA is a 48 months’ project organised in 9 main Work Packages, with the structure and relations between them described in the Description of the Action and shown below:

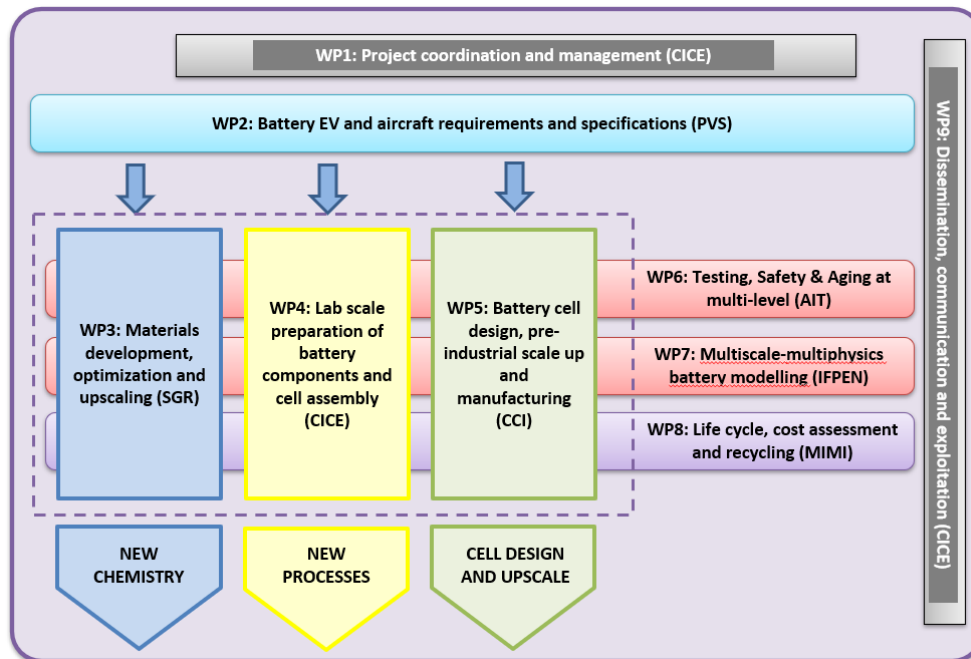


Figure 1: Work package structure

The detailed description of each WP can be found in the GA. However, a short description of them is shown as follow:

- **WP1** will carry out the necessary management activities in order to effectively coordinate of the overall project work plan and guarantee coherence between work packages.
- **WP2** will obtain from OEMs a unified set of halide-based solid-state battery cells requirements and specifications (including testing and recycling targets) in terms of performance and safety, for use in both automotive and aerospace sector, through a convergent process of identifying, consolidating and prioritizing aspects of battery design and behaviour.
- **WP3** will develop and provide the required materials to prepare battery components in WP4 and WP5. Particularly a) novel halide solid electrolyte, b) NMC active materials; c) pristine and coated Li metal; and d) electrochemically modified Li metal anode. Besides, samples will be produced considering the compatibility of these materials with the recycling process.

- **WP4** will process and optimize the materials received from WP3 into the battery components evaluating the electrochemical performance at basic lab-cell scale in cells of 1-4mSh/cm², to develop monolayer pouch cells of 40 mAh, as well as processing of battery components for upscaling them through wet coating and extrusion processes. Besides, WP4 will generate understanding on (intra)interfaces of the full cells and the post-mortem analysis for their optimization.
- **WP5** will focus on the large-scale production of cathode/electrolyte bilayer and assembly of prototype cells (1-10Ah).
- **WP6** will define test protocols and safety aspects to perform all final testing and validation on the pouch cells transferred from WP4 and WP5 ensuring the required KPIs. This WP will also generate the necessary data for validation of numerical modeling performed in WP7
- **WP7** will develop a multiscale/multiphysics modelling approach able to account for optimization from material to cell design and exhibit the consequence up until the final application system.
- **WP8** will evaluate the developed battery design regarding sustainability and recycling aspects. Besides, social impacts of these new batteries will be addressed by conducting a Social Life Cycle Assessment.
- **WP9** will communicate and disseminate the project results, ensuring the establishment of interactions, dialogue and co-creation with relevant stakeholders and publics related to this topic on regional/national and European level. IPR issues and exploitation of novel products will be addressed under this WP

The main characteristics of the WPs are presented in the following table:

Table 3: Work package list.

WP	WP Title	Leader	PMs	Start	End	
1	Project coordination and management	1	CICE	58,5	M1	M48
2	Battery EV and aircraft requirements and specifications	12	PVS	57,0	M1	M12
3	Material development, optimization and scale up	3	SGR	149,5	M1	M24
4	Lab scale preparation of battery components and cell assembly	1	CICE	181,0	M1	M42
5	Battery cell design, pre-industrial scale up and manufacturing	8	CCI	132,0	M24	M45
6	Testing, Safety and Aging at multi-level	2	AIT	110,5	M2	M48
7	Multiscale-multiphysics battery modelling	11	IFPEN	116,5	M1	M48
8	Life cycle, cost assessment and recycling	10	MIMI	63,0	M7	M46
9	Dissemination, communication and exploitation	1	CICE	45,0	M1	M48

Each WP has its own **WP Leader**, whose responsibility is the completion of the work described for each of the Work Package in the Annex I of the Description of the Action. Furthermore, each WP is divided into several tasks, which each of them is led by a **task leader** to develop the expected work efficiently and report the progress of the work to the relevant WP leader.

3.2 PROJECT DURATION AND TIMING

The duration of the project will be of **48 months starting as of 1 June 2022** (starting date) and will finish on the **31st of May 2026** and the work will be reported to the EC

along three reporting periods. Further detailed information about the timing of the project can be found in the Grant Agreement (page 137)

3.3 DELIVERABLES

The list of deliverables for the 48 months of the project is shown below. Each deliverable must be finished and submitted by the PC to the EC at the latest on the date in the table below. In case a delay is foreseen, the responsible of the deliverable should inform the PC and the participants involved in the deliverable to apply the necessary corrective actions and the PC will report should be reported to the EC Project Officer, if needed.

Table 4: List of deliverables

Deliverable Number & Name	WP	Lead	Type	Diss. level	Date
D1.1 Project Management Handbook	1	ZAB	R	PU	M3
D1.2 Data Management Plan	1	ZAB	DMP	SEN	M6
D2.1 Automotive and aeronautic consolidated requirements report	2	PVS	R	SEN	M5
D2.2 Automotive and aeronautic testing protocols	2	FEV	R	SEN	M12
D2.3 Recycling targets and safety requirements based on the chemistry of HELENA battery system	2	MIMI	R	PU	M10
D3.1 Halide optimization, stability and upscaling	3	SGR	R	SEN	M20
D3.2 NMC-based cathode optimization, stability and upscaling	3	UMI	R	SEN	M20
D3.3 Assessment of the Li metal protective layers (2 methods) and upscaling	3	LV/ RWTH	R	EU- Sec	M24
D4.1 Electrochemical performance from dry-processed components	4	CICE	R	SEN	M30
D4.2 Electrode and electrolyte processing via extrusion	4	TUB	R	SEN	M28
D4.3 Monolayer pouch cell design & assembly definitions	4	AIT	R	SEN	M32
D4.4 Interface analysis of components and cells	4	RWTH	R	SEN	M42
D5.1 Cell format and architecture of demonstrator cells	5.2	CCI	R	SEN	M30
D5.2 Cell assembly techniques for multilayer pouch cells	5.4	CCI	R	SEN	M36
D5.3 Final design and specifications of 10Ah cells	5.5	CCI	DEM	PU	M45
D6.1 Safe handling & testing protocols	6	FEV	R	SEN	M8
D6.2 Electrochemical evaluation of the cells according to the end user requirements	6	AIT	R	SEN	M48
D6.3 Stability and safety evaluation of components and cell aging	6	RWTH	DEM	SEN	M48
D6.4 Results on abusive testing and safety	6	FEV	R	SEN	M48
D7.1 Multiscale/Multiphysics modelling framework definition and requirements	7	IFPEN	R	PU	M6
D7.2 Solid electrolyte and solid/solid interfaces modelling	7	CICE	R	SEN	M24
D7.3 Cell level model of Gen 4b battery	7	IFPEN	R	SEN	M30
D7.4 System level model of aeronautic and automotive applications	7	AIT	R	SEN	M36

D7.5	Report on the use of the modelling network for cell design and optimisation	7	IFPEN	R	SEN	M47
D8.1	Recycling strategy and experimental plan for the HELENA battery cell	8	MIMI	R	SEN	M18
D8.2	Evaluation of the recycling strategy and best practices for end-of-life handling battery cells	8	MIMI	R	SEN	M40
D8.3	Evaluation of the environmental impact and sustainability of the HELENA battery cell	8	MIMI	R	SEN	M46
D9.1	Dissemination and exploitation plan including communications activities	9	ZAB	R	SEN	M6
D9.2	Project website and social media presence	9	CICE	DEC	PU	M5
D9.3	IPR management plan	9	CICE	R	SEN	M12
D9.4	Exploitation plan	9	ZAB	R	EU-Res	M48

Please note that the following codes have been used:

- The nature of the deliverable:
 - o **R** = Document, Report
 - o **DMP** = Data Management Plan
 - o **DEM** = Demonstrator, pilot, prototype
 - o **DEC** = Websites, patent filings, videos, etc.
- The dissemination level:
 - o **PU** = Public
 - o **SEN** = Sensible

3.4 MILESTONES

The list of milestones to be achieved during the project lifetime is shown in the following table:

Table 5: List of milestones

Milestone Number and Name	WP	Date	Means of verification
MS1 Selection and delivery of preliminary materials for further processing and characterization	3	M6	Delivery of materials in 100/150g scale as defined in WP3. Report available by means of deliverable D3.1 and D3.3
MS2 Requirements for cell testing protocols	2	M12	Report available by means of deliverable D2.2
MS3 Fabrication and characterization of coin cells with first materials supplied	4	M12	1st batch of coin cells tested.
MS4 Multiscale/Multiphysics network operational	7	M16	First molecular to cell simulation performed Deliverable D7.1
MS5 Upscaling and delivery of optimised materials based on characterization and processing feedback in WP3-4	3	M24	D3.1, D3.2 and D3.3

MS6	Processing of components via extrusion	4	M28	Transferring of processing parameters to partners for upscaling D4.3
MS7	First pouch cells (up to 40 mAh) with improved materials assembled	4	M28	1st batch of pouch cells delivered for testing against KPIs and interface characterization.
MS8	25 cell prototypes of 1-10 Ah ready for testing	5	M36	Cells delivered to partners for testing
MS9	Cells with optimized performance for aeronautic and EVs	6	M42	Electrochemical, safety testing and post-mortem analysis finished
MS10	Validation and quantification of the recycling route	8	M46	D8.3. The recycling strategy is supported by experimental data and published in a peer review journal
MS11	Exploitation plan completed	9	M48	D9.4 accepted by all partners

3.5 BUDGET

The estimated budget for the action is set out in Annex II to the GA and the Maximum grant amount to the HELENA project is **EUR 8.366.963,50**.

The distribution of each of the partner's budget is an estimation. It is possible to reallocate expenses from one category to another one, or from one WP to another without any amendment request, as far as the amounts are not significant. However, this reallocation of expenses may require the explicit approval of the EC.

4 REPORTING OBLIGATIONS

The project reporting is the procedure used by the EC to follow up, monitor and verify that the project is implemented in compliance with the Annex I of the GA. There are contractual tasks that make the project monitoring most relevant at certain periods in project's life, in particular after each reporting period at the time of payments. In accordance with the GA, project reporting obligations with the EC are the following:

- **Deliverables** identified in Annex 1 - Description of the Action;
- **Periodic Reports** (both technical and financial) within 60 days of the end of each period. All reports require a high level of detail and justification;
- **Final Report** at the end of the project, consisting in a summary of the technical work carried out for publication and the financial report (and Certificate Financial Statements, if applicable)
- **Payments**, including prefinancing, internal payments and the final payment.

4.1 PROJECT DELIVERABLES SUBMISSION

The list of deliverables for the 48 months of the project is shown in Section 3.3 of this document. The leader of the relevant deliverable will coordinate the contributions of all participants involved in the deliverable and the final version will be sent by email to the project coordinator.

After the final approval from the project coordinator, the final version of the deliverable in pdf format will be uploaded and submitted by the project coordinator on the Funding & Tenders Portal, according to the timetable specified in the Deliverables list.

4.2 PERIODIC REPORTING & FINAL REPORT

This chapter describes the details of the reporting HELENA and EU procedures and the planning per reporting period.

4.2.1 Schedule

The HELENA project is divided in 3 reporting periods of the following duration:

- **RP1**: from month 1 to month 18 (01/06/2022 – 30/11/2023)
- **RP2**: from month 19 to month 36 (01/12/2023 – 31/05/2025)
- **RP3** or **Final Report**: from month 37 to month 48 (01/06/2025 – 31/05/2026)

At the end of each reporting period, the EC shall evaluate and approve the project reports and deliverables and distribute the corresponding payments within 90 days of their receipt. In the case that the EC requests any further information, clarification or documentation on the periodic report, the time of 90 days will be stopped from the EC side restarting the count-down upon reception of requested information.

4.2.2 Structure and Content

The structure and content of the periodic reports are defined by the EC. A template of the Periodic report prepared by the EC for the H2020 Work Programme is available here: https://ec.europa.eu/research/participants/data/ref/h2020/gm/reporting/h2020-tmpl-periodic-rep_en.pdf

The Periodic Report is twofold and structured as follows:

- 1) The **Technical Report** (divided into 2 parts):
 - a. **Part A** structured tables, which need to be filled in directly on the Funding & Tenders Portal:
 - i. cover page;
 - ii. publishable summary;
 - iii. web-based tables covering issues related to the project implementation (e.g. work packages, deliverables, milestones, etc.);
 - iv. answers to the questionnaire about the economic and social impact.

**Please note that this part is automatically generated by the IT system based on the information entered by all partners through the periodic report and continuous reporting modules.*

**In the final report, a publishable of the entire project including an overview of the results will be added.*
 - b. **Part B** the free text, core part of the report that the Coordinator must upload in the Funding & Tenders Portal as a single pdf document with the following information:
 - i. explanations of the work carried out by all beneficiaries and affiliated entities during the reporting period;
 - ii. an overview of the progress towards the project objectives, justifying any differences between work expected under Annex I and work actually performed, if any.
- 2) The **Financial Report** that consists in structured forms in the Funding & Tenders Portal, including:
 - a. An individual financial statement from each beneficiary;
 - b. An explanation of the use of resources and the information on subcontracting and in-kind contributions provided by third parties (if applicable) from each beneficiary;
 - c. An explanation of the other direct costs, if they are over the 15% of the personnel costs claimed during the relevant period;
 - d. A periodic summary financial statement, created automatically by the electronic exchange system, consolidating the individual financial statement.

**Please note that in order to avoid problems with payments by the EC, it is important to take into consideration the cost justification requirements of the EC from the very beginning of the project.*

**In the final report, the Certificate of the Financial Statement of the relevant beneficiary or affiliated entity will be included.*

4.2.3 Procedure of submission

The coordinator is responsible to submit both reports, technical and financial to the EC via the Funding & Tenders Portal within 60 days following the end of the last reporting period.

4.2.4 Collection of Information from the participants

For the preparation of the periodic reports, technical and financial inputs from beneficiaries are crucial to ensure a qualitative reporting to the EC.

The workflow to collect the **technical inputs** is the following:

- 1- The coordinator will launch the process of collecting the technical inputs sending reminders to the WP Leaders before ending the reporting period.
- 2- WP Leaders will prepare the corresponding WP description asking for necessary inputs to Task Leaders and other beneficiaries, if applicable. The timeline for this task should take around 1 month approximately.
- 3- The coordinator will review the WP descriptions provided by the WP Leaders. In case of any additional explanation, the process will start again and the timeline for this task should be around 2 weeks.
- 4- The coordinator will include all WP description in a single document and, after the final approval of all inputs, will submit the report to the EC via Funding & Tenders Portal.

Regarding the collection of the **financial inputs**, the workflow is the following:

- 1- The coordinator will launch the process of collecting the financial inputs sending reminders to all beneficiaries before ending the reporting period.
- 2- The beneficiaries will provide their individual Financial Statement including explanation of the use of resources to the coordinator. The timeline for this task should take around 1 month approximately. In the final report, the relevant beneficiary will prepare the Certificate Financial Statement (CFS).
- 3- The coordinator will review whether all costs declared are correct and duly explained. In case of any additional explanation, the process will start again and the timeline for this task should be around 2 weeks.
- 4- Once the coordinator approves each individual financial statement, each beneficiary shall complete electronically the model for the Financial Statement in the Funding & Tenders Portal and be signed by the corresponding Project Financial Signatory (PFSIGN) appointed by each entity.

4.3 CONTINUOUS REPORTING

Once the project has started, the “continuous reporting” module will be activated by the EC allowing beneficiaries to contribute on an ongoing basis via Funding & Tenders Portal. The inputs to be provided are structured as follows and can be filled in during the project lifetime:

- Publishable summary
- Submission of deliverables
- Report progress in achieving milestones
- Follow up critical risks
- Questionnaire on horizontal issues
 - o Publications
 - o Dissemination and Communication activities
 - o Rest of questionnaire on horizontal issues (Patents, SME Impact, Gender, etc.)

5 PROJECT MANAGEMENT

5.1 MANAGEMENT STRUCTURE

For the proper management of the project, a management structure has been created as follows:

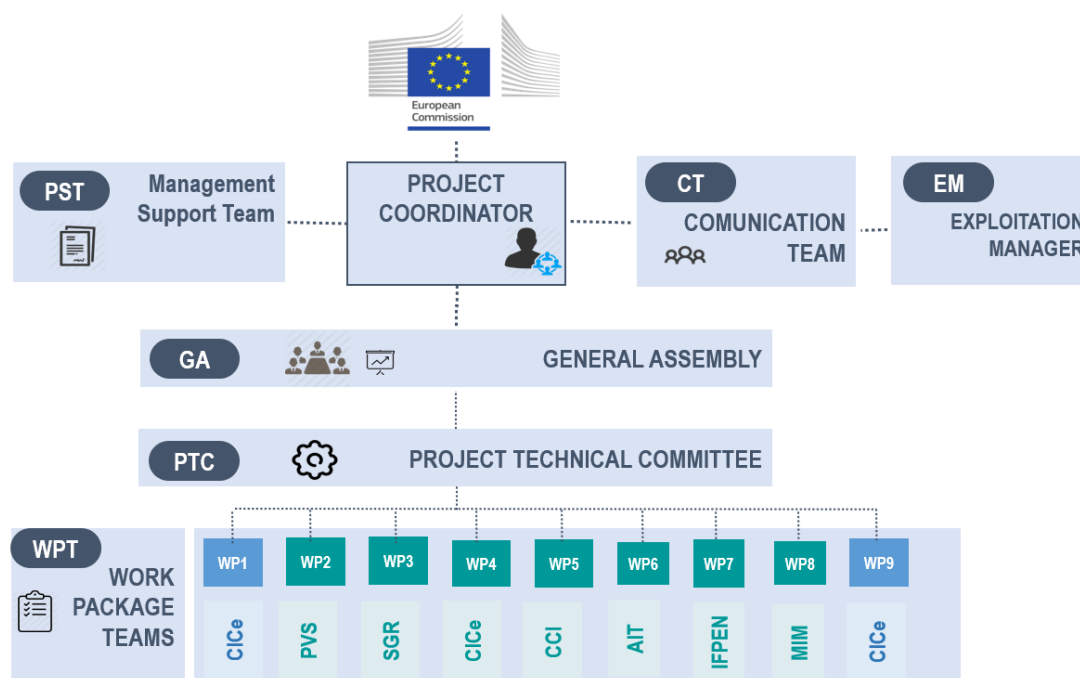


Figure 2: Management structure

The organizational structure comprises:

- Project coordinator
- General assembly
- Work Package Leader Board (WPLB)

And the following support figures:

- Management support team
- Communication team
- Exploitation manager

5.1.1 Project Coordinator

The Project Coordinator (PC) is the legal entity acting as the intermediary between the Parties and the Funding Authority. The coordinator must also perform their activities as a consortium partner as it is described in the grant agreement.

Pedro López-Aranguren, Associate Researcher of the Advanced Electrolytes and Cell Integration group, has been appointed as designated Project Coordinator (PC) for HELENA. Pedro, and the whole team of CICe, which is an entity with a long track record in project management of EU project, will act as project coordinators. The main responsibilities of the Project coordinator are:

- Administrative management of the project.

- Overall technical coordination of the scientific and technical work plan;
- Project development Quality assurance.
- Request and review deliverables, reporting periods or any other information required and verify their quality and completeness before to send it to the EC.
- Final review and approval of deliverables submitted to the EC; .
- Assures that the other beneficiaries get paid their eligible costs once the money is paid to the coordinator.
- Inform the granting authority about the payments made to the other beneficiaries (Articles 22 and 32 of the GA).
- Notifying the project officer of developments that may require amendments of the Grant Agreement.
- Chairing General Assembly, Executive Board and Stakeholder Group meetings

5.1.2 Management Support Team

The PC will be supported by ZABALA in administrative, operational and legal tasks of the project as well as the internal communication. Of course, all partners have their responsibility to perform the tasks they are assign to in time, within budget, and to a *high quality*.

The management team will perform the following activities:

- **Quality control.** This task will consist of a review to monitor the quality of documents while they are being developed and an approval procedure that will allow to each partner to verify the quality of the results and ensure that their objectives are achieved on-time and on-budget.
- **Coordinating and managing** administrative matters and giving administrative support to all partners;
- **Monitoring of progress** with the work performed, compilation of project deliverables and the achievement of milestones, including the verification of the quality, respect of time and costs constrains and relevance for impact;
- **Formal review and submission of progress reports** to the EC and any other document or communication pertaining to the project. The consortium will prepare 3 Technical Progress Reports and Financial Reports during the whole project: Period 1 (M1-M18), Period 2 (M19-M36) and Period 3 (M37-M48). The coordinator will prepare 3 review meetings (linked to reports) with the designed EC manager and reviewer(s) to ensure the implementation is in line with the timeline and budget, provide guidelines and define corrective measures; and any additional meeting if required by EC.
- Moreover, the consortium will prepare technical and financial progress reports each 6 months.
- Ensuring **financial management** (cost monitoring, accounting, cost statement preparation, distribution of funds conforming with the stipulations of the Grant Agreement;
- Project **risks management** and contingency planning;
- Supervising and informing all partners about the project progress.
- Act as **contact point** for all partners and maintaining a high level of communication within the consortium;

- Organising and documenting project meetings, like General Assembly, and Work Package Leaders Board;

For legal, administrative and technical issues the partners should contact the project management team before contacting the Project Officer (both CICE and Zabala).

5.1.3 General Assembly (GAS)

The General Assembly (GAS) is the ultimate decision-making body of the Consortium, aiming to advise and support the decisions of the Work Package Leader Board (WPLB). The GAS will be responsible of the major decisions affecting the implementation and success of the project). It is composed of one empowered representative of each partner of the consortium and chaired by the Project Coordinator. The main tasks and action to perform are:

- Overall project process assessment of technical activities, schedule, cost breakdown, periodic reports, etc.
- Re-definition of the work-plan.
- Budget allocation resources.
- Communication between subgroups.

The GAS meetings will be held every 6 months (M6, M12, M18, M24, M30, M36, M42, M48) and will gather all the consortium partners. Decisions will be taken in consensus, and if not possible in case of majority vote. The project plan will be updated after the meetings, if necessary.

5.1.4 Work Package Leader Board (WPLB)

Each WP have a WP leader entity who is responsible of the operational decisions made in the WP and that will guarantee the accomplishment of the WP's objectives. The main responsibilities of the WP leader are:

- Overall coordination of the tasks performed in the WP. With all the partners involve in each task, the WP leader will identify, plan and coordinate all the tasks and activities to perform.
- Monitor the technical quality of the work, in order to achieve the expected results.
- Inform in the PTC meetings on the progress achieved, results obtained, and problems encountered.
- Coordinate with other WPs or tasks leaders.
- Responsible to coordinate and preliminary approve of the deliverables produced in each WPs.
- Identify and inform about critical risk within the WP.
- Prepare the technical progress reports, with the help of WPs leaders.

The work packages leaders were identified:

Table 6. Work package leaders

WP	WP Title	Leader	Responsible
1	Project coordination and management	CICE	Pedro López
2	Battery EV and aircraft requirements and specifications	PVS	Ursa Skerbis
3	Material development, optimization and scale up	SGR	Thomas Marchandier

4	Lab scale preparation of battery components and cell assembly	CICE	Simon Lindberg
5	Battery cell design, pre-industrial scale up and manufacturing	CCI	Alaa Almousli
6	Testing, Safety & Aging at multi-level	AIT	Nadia Ajjan-Godoy
7	Multiscale-multiphysics battery modelling	IFPEN	Sara Abada
8	Life cycle, cost assessment and recycling	MIMI	Fabian Díaz
9	Dissemination, communication and exploitation	CICE	Ignacio Castillo

Work Package Leader Board (WPLB) will meet every month. Audio/video conferences will be held to monitor the technical aspects of the project activities. One physical meeting every 6 months will be organized prior to the GA and monthly meetings (videoconferences), gathering the PC and the WP leaders. As mentioned before, WP Leaders will be in charge of leading technical progress in order to ensure WP goals are met on time and within budget restrictions and of reporting research progress to the WPLB.

5.1.5 Communication Team

HELENA have a dedicated WP for the dissemination, communication and exploitation of project results (WP9). The objective of this WP is to ensure the necessary dissemination and communication activities will be planned and undertaken according to the stage of the project and will make use of appropriate communication channels. The leader of the WP is CICE with a strong contribution of Zabala. Moreover, all the consortium partners have dedicated resources to this task.

Article 17 of the GA, governs the communication, dissemination and visibility of the project. As stated, any dissemination of results (in any form, including electronic) must:

- Display the EU logo and
- Include the following text: "Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them."

5.1.6 Exploitation Manager (EM)

HELENA is focused on developing research and innovative technologies with the main and final goal to deliver a new halide-based battery on the EV and aircraft markets in the mid-term, to bring a disruptive Gen 4b cell technology up to TRL 5 with a final 10 Ah efficient and safe cell prototype reaching 400 Wh/kg and 3000 Wh/L.

HELENA have a dedicated tasks to ensure the final scale up of the technology and the future commercialization: Development of an exploitation action plan (T9.4). This task will be led by Zabala, as follows:

1. Create a list of interested stakeholders (preferably with an industrial background), contact them and establish working relations;
2. Prepare introductory information to facilitate contact with external organisations, complementary research, industries or potential end-users;
3. Outline the exploitation strategy for the project results;
4. Analysis of market and competition, as well as possible risks and contingencies;
5. Identification of synergies and markets for the results and

6. Analysis of funding opportunities and possibilities of setting up follow-up projects. Information will be included in an exploitation plan which will demonstrate how the HELENA technology will match the market and user needs in a cost-effective manner, enhancing the competitive advantage of the future EU industry of halide-based batteries for the automotive and aeronautic industries.

A first draft of the exploitation plan will be delivered in month 6 within the deliverable 9.1: Dissemination and exploitation plan including communication activities.

The final exploitation plan (D9.4) will be delivered in M46. The exploitation plan will identify, coach, integrate and synchronise individual and joint exploitation plans of the partners in order to accelerate the post-project update of HELENA project results.

In addition, Aloña Salazar (CICE) will be the HELENA exploitation manager for the individual and group exploitation of the results obtained throughout the project. Aloña has a degree in Materials Engineering and more than 10 years of experience in knowledge protection, IP management and Technological Surveillance.

5.2 PROJECT MANAGEMENT PROCEDURES

5.2.1 Project meetings

The project meetings are summarized here:

Table 7: Project meetings

Meeting	Periodicity	Type of meeting
Kick of meeting	M1	Presencial
General assembly	M6, M12, M18, M24, M30, M36, M42, M48	Presencial/online
Work Package Leader Board (WPLB)	Each month	Online /Presencial once each 6M.
Final meeting	M48	Presencial

All the presential meetings will be held via online in case that some of the partners are not able to attend the meeting. GAs and PTC, meetings will be held simultaneously, when the date of the meeting coincides.

A part of the above-mentioned meetings, technical work meeting can be carried out at any time.

5.2.2 Voting rules/decision taking mechanism

Decision will be taken by the use of votes. Each beneficiary (without including third parties) will have one vote. The general rule is that decisions will be taken by a majority of 2/3 of the votes.

The following decisions are agreed by a majority of two-thirds (2/3) of all Parties:

- Changes in the Annex 1 and Annex 2 of the Grant agreement (to be agreed later by the funding authority)
- Changes in the Consortium Agreement
- Entry of a new partner to the consortium
- Withdrawal of a Party from the consortium and the approval of the settlement on the conditions of the withdrawal.

5.2.3 Decisions taken without a meeting

Among the decisions taken without a meeting we can find (non-exhaustive):

- Communication among project partners on a timely basis
- track the project progress against programme objectives.
- Organize meetings.
- Prepare project reports: technical and financial.
- Have the overall responsibility in the technical performance of the project.
- Appoint a technical team.

5.2.4 Conflict Resolution

Conflicts may arise along the project execution and can have a harmful impact on project implementation in terms of efficiency and effectiveness. For this reason, a clear strategy of conflict resolution is needed. In HELENA, depending on the severity of the conflict, the procedure will be the following:

- For a day-to-day discussion about the project execution a consensus among partners will be needed.
- If the conflict is a relevant technological issue, (e.g.: he changes in the execution of the project that does not affect neither the work plan nor the allocation of resources), the issue will be approved by the interested parties by 2/3 of the votes. If one of the partners strongly disagrees the conflict can be scaled to the PTC or the GAS, where the conflict should be approved by 2/3 of the votes.
- For the most important questions (e.g.: relocation of resources) will be made by the General Assembly by 2/3 votes of the members. If a partner strongly disagrees the issue can be scaled according to the CA and GA.

5.3 RISK MANAGEMENT

5.3.1 Risk Analysis

A dedicated task for Risk Management task 1.4 has been established for the entire duration of the project. The main outcome of this task will be the Risk Management Plan which will be updated in the Periodic Reports.

The main sources of risks have already been identified during the project preparation phase and contingency measures have already been established:

Table 8: Main risks identified

No	Risk	WP	Mitigation measure
1	Unforeseen events that delay project execution. Likelihood: Low; Impact: Medium.	1	Risk contingency plan part of management handbook. CICE will monitor project execution and will allow adaptations and modifications if this proves improvements for results' achievement.
2	Failure of requirements addressing new and unexplored failure-mode mitigation options for Solid-state batteries. Likelihood: Low; Impact: Medium.	2	Particular attention shall be paid to obtain adequate knowledge about anticipated electrochemical and physical behaviour of novel cells to prevent an inadequate set of requirements be utilized by subsequent work packages.
3	Lack of compatibility between NMC materials and halide electrolytes. Likelihood: High; Impact: Medium.	3	Screening of a large number of active materials with variations in Ni content, crystallinity and surface chemistries done at Umicore.

4	Desired Properties of Li-metal protecting layer are not enough to reach battery performance targets Likelihood: Low; Impact: High	3	Multiple routes are explored, and some involve different material choice in the form of hybrid.
5	Difficulties on the optimisation of the individual components and interfaces to reach the proposed loading target (4 mAh cm ⁻²) Likelihood: Low; Impact: Medium.	4	In the case of a lower specific capacity of the cathode composite due to an increased fraction of the catholyte component, the thickness of the electrode will be increased to reach the desired areal capacity. The thickness of the electrolyte could be decreased to compensate the loss of energy density.
6	The manufacturing of the monolayer pouch cell being more challenging and time-consuming than expected (delays) Likelihood: high; Impact: Medium.	4	Having partners participating in both, processing of individual components and the monolayer pouch cell assembly, will generate preliminary know-how and experience for the combination of all components into the monolayer pouch cell.
7	Performance losses cell components due to production environment at CCI. Likelihood: Low; Impact: Medium.	5	Based on the outcomes of WP3 and T5.1, CCI will continuously adapt its current processes to the specified handling conditions including measures like minimalization of humidity exposure and additional heat treatment.
8	Cells suffering from stability issues during cycling or due to internal degradation or damage Likelihood: High; Impact: Medium.	6	HELENA has developed contingency mechanisms to ensure high performance cells: from materials (i.e several grades of NMC, optimization of halides, different protective Li metal layers...) to processing routes (I.e., wet coating, extrusion) and production environments (I.e., glovebox, dry room)
9	Simulation times too short to reach ergodicity in the MD models or issues with FEM mechanical simulation Likelihood: Medium; Impact: Low.	7	Improve statistics by (i) performing much longer MD trajectories, or (ii) reducing the size of the materials models and run several simulations for these different smaller volumes to quantify uncertainties. Choose a representative simplified geometry to ensure efficient calculation. Simplify the problem formulation to reduce complexity. Adjust the model parameters using experimental results from WP6
10	Delays or mis-estimation of materials supply for project activities Likelihood: Low; Impact: High	8	A preliminary materials flow table has been already defined among the partners in order to estimate the materials requirements for each activity. This will mitigate any risk on materials supply thus any delays on processing, cell development and recycling.
11	Dissemination activities do not reach the targeted groups Likelihood: Low; Impact: Medium.	9	A comprehensive Communication and Dissemination plan will be developed with the main goal of identifying further stakeholders and potential end user and defining clear strategies to reach each target group. Several partners are in a good position to approach relevant European actors, while others have a wide technical dissemination background
12	Exploitation targets not achievable in the given time	9	Clear exploitation goals set out early in the project on the exploitation plan covering and

	frame Likelihood: Low; Impact: Medium.	balancing both incremental improvements as well as significant/revolutionary development steps - must be realistic, measurable and achievable.
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5.3.2 Critical risks and risk mitigation

A risk management procedure has been established in order to systematically identify, assess and manage risks. The steps are the following:

- **Identify risks.** The purpose of this step is to identify and document project's risks. When new risks arise, this should be documented and analysed. The risk identification remains as a continuous process through all the life cycle of the project. Risks identified must be documented and discussed in the follow up meetings. Risks can be identified by each partner.
- **Risk assessment.** The likelihood and severity of the risk will be assessed in this step. Likelihood and severity can be considered low, medium and high. Medium and high risk will be dealt with high priority.
- **Risk response-strategy.** The objective is to establish to plan the necessary actions to mitigate the risks. Three strategies can be chosen to deal with the risk:
 - o **Avoid risk.** The strategy is to eliminate the causal factor before it occurs.
 - o **Mitigate risk.** A mitigation plan is developed to minimize the impact of the risk.
 - o **Accept risk.** No further actions are expected for this kind of risks. This strategy can only be adopted for low risks and close monitoring is needed.
- **Control risk-response activities.** In this step risk-response will be monitored and controlled. To do so, the risk owner will be held responsible to monitor risk evolution and evaluate the effectiveness of the assigned response plans in a continuous manner.
- **Record.** The risk management plan will be updated with clear risk-response tasks when necessary.
- **Report.** The PTC and the GAS will be informed about new risks and its mitigation measures.

The PTC and GAS meeting will discuss, monitor and control the risks that arise along the project.

5.3.3 Role of the partners and the coordinator in risk management

The roles and responsibilities in risk management are:

- Task leaders: will identify risks, develop mitigation strategies and contingency plans for their tasks and monitor risks. Report potential risk factors to their Work Package Leader.
- Work Package Leaders, consolidate risk and develop mitigation strategies and contingency plans on WP level. Report potential risk factors to the Project Coordinator and other WPLs.
- Project Coordinator, responsible for the risk management of the whole project. Identifies risk, develops mitigation strategies and contingency plans, monitors risk and reports risk status in the periodic progress reports to the EU, including planned contingency measures.

All the consortium members will be responsible of risk identifications and propose risk mitigation measures.

5.4 QUALITY CONTROL

Quality control is the set of planned and systematic activities applied in a quality management system to ensure that the requirements of the outcomes.

A dedicated task for quality assurance was established in the workplan (Task 1.1: Operating procedures & quality assurance. The task will be led by Zabala and will be carried out throughout the project.

5.4.1 Quality assurance procedure

During the preliminary phase of the project, ZAB (with the support from all the partners) will elaborate a Project Management Handbook (this document) to ensure a proper implementation and quality performance of the project. This PMH will be aligned with the HE requirements and will include the guidelines to be followed for financial reporting, presentation standards for deliverables, reports to the EC and quality assurance measures. Within the PMH and to guarantee project quality a Quality Assurance Plan (based on ISO 9001 and 14001) will be defined by ZAB and CICE at M1 and it will include all the project procedures (information, reporting, dissemination, etc.). Simple output indicators will be developed for each WP with the aim to monitor the fulfilment.

During the rest of the execution of the project, the quality assurance of the project will be carried out at two levels:

- Monitoring of the quality of documents while they are being developed and an approval procedure that will allow to each partner to verify the quality of the results and ensure that their objectives are achieved on-time and on-budget. Public deliverables, public project documents, patent applications, and invention disclosures will be submitted to the quality review and approval procedures.
- Monitoring the milestones of the project as well as other 'non-formal' internal milestones.

5.4.2 Quality management

Deliverable quality management

The deliverable must be created according to the working plan. Each deliverable has a deliverable leader (already specified in the work plan). The deliverable leader is the responsible to create a first version of the document or ask to the other deliverable contributors for the information needed. The deliverable leader is the responsible to compile and edit the draft. Once a first draft is completed, the draft will be circulated to all the partners involved to the deliverable for its final revision and approval. After that, the final version will be sent to the project coordinator for the final approval and submission to the EC Participant Portal.

The following table shows the process and timeline of deliverables' submission:

Table 9: Deliverables' submission timeline

Phase	Responsible	Time before deadline
Align on key aspects of the deliverable	Deliverable leader and contributors	8 weeks
First draft	Deliverable leader	7-6 weeks
Review	Deliverable contributors	6-5 weeks

Corrections	Deliverable leader	4-3 weeks
Final comments	Deliverable contributors	2 weeks
Approval	Validation body and PC	1 week
Submission to the EC	PC	Submission deadline

Besides, all technical deliverables should have:

- Public executive summary (1-2 pages)
- Core part of approx. 10-15 pages (depending on the kind of report): real content on the technical developments, with clear description what work was done, results and a discussion why certain decisions were taken, based on the provided technical information
- Risk table (if applicable) with real risks and an elaboration on the risks
- Conclusions and recommendations for future work

The authors should use the deliverable template provided.

Project management and control.

Along the project execution the following indicators will be monitored:

Table 10: Indicators monitored

Indicator	Responsible
Work package start and end according the schedule.	WP Leader
Task start and end according the schedule.	Task leader
Deliverable produced on time.	Deliverable leader
Deliverable in accordance with the templates and editing guides, ready for submission.	Project coordinator
Technological performance	PTC

6 INFORMATION MANAGEMENT

6.1 INTERNAL COMMUNICATION

The regular tool for internal communication is Teams. Via Teams online meeting will be performed and general documentation will be shared among partners. The information shared via Teams are templates for the project, meeting minutes and presentations, working documents and deliverables (non-confidential). All the team members have access to the Teams. Any change will be communicated and managed by Zabala.

Some simple rules for internal emails:

- Start your message subject with: HELENA
- Use e-mail in a good way: do not overuse/spam
- Use Teams for sharing large documents
- Make clear what you expect from others (detail, timing, how to receive)
- Confidentiality: mark your messages if the info is confidential

Contact list:

- Contact list is responsibility of ZAB
- Partners to make sure the correct info is at ZAB
- List can be found on Teams

A list of all the team members involved in the consortium is also available in the Teams. Any change in the list will be managed by Zabala.

6.2 ACCESS RIGHTS

Access rights will follow the structure proposed in the annotated grant agreement as follows:

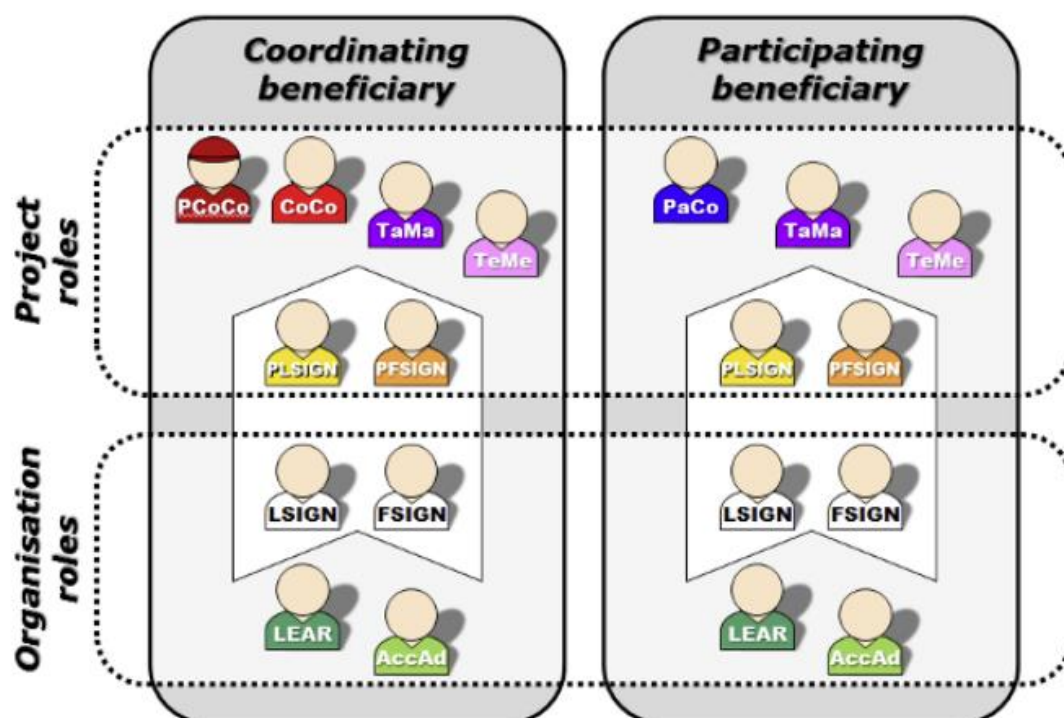


Figure 3: Access structure

6.3 FINANCIAL INFORMATION – PAYMENT PROCEDURES

As established in the Grant Agreement (Article 22) the payments will be made from the Commission to the Coordinator. All the costs will be reimbursed by the coordinator to each party under the procedures defined in the CA and GA.

There will be four payments according to the section 4.2 of the GA:

- Prefinancing. After the start of the project M1.
- 1st Interim payment. After the first reporting period M1-M18.
- 2nd Interim payment. After the first reporting period M19-M36.
- Final payment. After the final periodic report M37-M48.

7 DOCUMENT HANDLING

7.1 INTERNAL REPOSITORY: file sharing, email correspondence, etc

An exhaustive Data Management Plan (DMP) will define how data will be handled through the project and beyond, following FAIR principles (T1.5). The first version of the deliverable will be delivered in M6 and updated in M42. This task is also responsible for the detection and assessment of the knowledge generated by the consortium.

In the DMP will guarantee the findability of data/research outputs: datasets will be stored on Zenodo, automatically becoming part of OpenAIRE, the EC-funded initiative supporting the Open Access policy. Each will be assigned a unique identifier

An internal SharePoint has been created to store all the management information created along the project. The non-exhaustive list of information contained is:

- Meeting minutes for Steering consortium meetings and general assembly meetings. Including the Kick of meeting and the end-meeting.
- Templates. Presentations templates, deliverable template, meeting minutes, etc
- Deliverables. All the deliverables (public or non-public) will be stored in the internal SharePoint and available for the other partners.
- Grant agreement and consortium agreement will be available in the internal repository.
- WPs. Working documents for each WP will be stored in the internal repository.

7.2 LANGUAGE

According with the Grant Agreement (GA), the reporting will be in the language of the Agreement (Article 21.4 of the GA), that is English. Audits (including audit reports) will be in the language of the Agreement (English), according to the GA.

All the consortium meetings will be held in English with the exception of internal meetings (technical working meetings) where the language where the working language can be chosen by the entities. In case of disagreement the language will be English.

7.3 TEMPLATES

The project coordinator (PC) will distribute to all the consortium partners template for all the documentation generated throughout the project. The templates available are:

- Meeting minutes.
- Power point presentation.
- Meeting minutes.

The templates will be available also at the Teams repository.

For the financial statements the document will follow the structure of the Annex 4 of the Horizon Europe Grant Agreement.

7.4 PROJECT LOGO

A complete procedure for the dissemination and communication of results will be detailed in the deliverable 9.1: 'Dissemination and exploitation plan including communication activities'. The document will be delivered in M6 and updated in M24.

Following the article 17 of the Grant Agreement, communication activities of the beneficiaries related to the action, dissemination activities and any infrastructure, equipment, vehicles, supplies or major result funded by the grant must acknowledge EU support and display the European flag (emblem) and funding statement (translated into local languages, where appropriate):

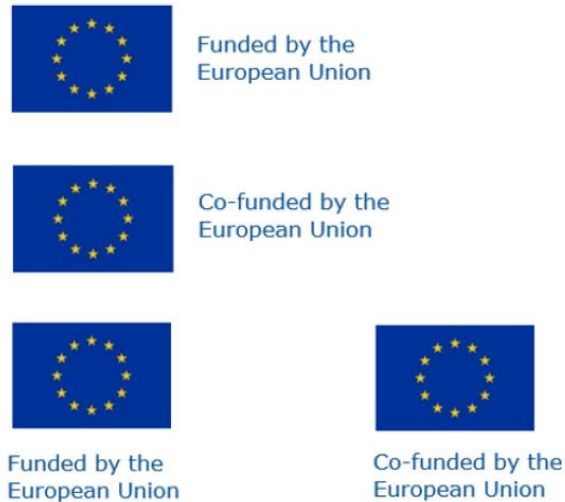


Figure 4: European flag and emblem

The emblem will remain distinct and separate and will be as visible as the project logo.

Project logo has been produced in M1. The logo will appear in all the communications, such as deliverables, presentations, press notes, etc. The inclusion of the project logo does not mean the removal of the EC logo.

8 PROJECT CHANGES

The basic principle of the project is to carry out the tasks and activities within the time scheduled and resources foreseen as described in the Annex I (DoA) of the GA.

Any changes in the status of a beneficiary shall be communicated to the Project Coordinator (CO) as soon as possible. The CO shall resolve queries and advise the beneficiaries. If required, the CO will contact the EC Project Officer responsible and request clarifications and procedures to be followed.

Significant project changes and deviations from the work planned must be dealt with in writing. The participant involved or WP Leader proposing the change should forward a written communication to the Project Management Board explaining the rationale of the proposed changes and direct consequences in terms of budget, work programme, etc.

As a general rule, an amendment to the GA is necessary whenever the GA or its annexes shall be modified. In some cases, the GA gives the parties the possibility to carry out certain modifications without an amendment to the GA.

Finally, **there can cases where the need for an amendment must be assessed carefully.** If an amendment to the GA is necessary, the PO will request the amendment to the PO on behalf of the consortium. Small changes during the implementation of the activities and/or the plan defined in the DoA shall be understood as normal in a research project. However, these minor deviations shall be identified and explained in the description of the activities of the corresponding periodic report and corrective measures that were implemented (if any).

8.1 CHANGES WITH REQUIRE AN AMENDMENT

The following changes require an amendment to the GA:

- **Removal of a beneficiary whose participation was terminated due to:**
 - o non-accession to the GA
 - o non-provision of the requested declaration on joint and several liability
 - o for other reasons.

If the beneficiary was participating with affiliated entities, they will automatically be removed.

- **Adding a new beneficiary.** If the new beneficiary is participating with affiliated entities, they will also have to be added.
- **Change of beneficiary** due to partial takeover, which means that a part of the business of the beneficiary is taken over by one (or more) other entity(ies).
- **Removing or Adding an affiliated entity**
- **Change concerning a beneficiary/affiliated entity “not receiving EU funding”**
- **Change of coordinator**
- **Change of the coordinator’s bank account for payments**
- **Change in the title of the project or its acronym, starting date, duration or reporting periods**
- **Changes to Annex 1 (Description of the Action)**
- **Changes to Annex 2 (estimated budget)**

- **Change in the maximum grant amount, reimbursement rate(s), the estimated eligible costs of the project, the amount of pre-financing or the contribution to the Guarantee Fund**
- **Change concerning specific cost categories (“specific unit costs”)**
- **If a universal takeover results in a change of beneficiary;**

8.2 CHANGES WITHOUT REQUIRE AN AMENDMENT

Amendments are NOT necessary in the following cases:

- for certain budget transfers;
- if the name or address of a beneficiary, affiliated entity or coordinator change;
- if there is a change in the name of the bank or the address of the branch where the po has an account, or in the name of the account holder.

9 CONCLUSIONS

This project management handbook aims to give the consortium specific instructions for carrying out day-to-day project tasks and to make it easier to keep track of HELENA's advancement. These guidelines should be adopted by all project's partners in order to ensure the quality of processes, reduce overall risks and ensure an adequate use of resources. To successfully contribute to the project all HELENA consortium members are aware of the general issues covered in this text.

10 Acknowledgement

The author(s) would like to thank the partners in the project for their valuable comments on previous drafts and for performing the review.

Project partners

#	PARTICIPANT SHORT NAME	PARTNER ORGANISATION NAME	COUNTRY
1	CICE	CENTRO DE INVESTIGACION COOPERATIVA DE ENERGIAS ALTERNATIVAS FUNDACION, CIC ENERGIGUNE FUNDAZIOA	Spain
2	AIT	AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH	Austria
3	SGR	SAINT GOBAIN RECHERCHE SA	France
4	UMI	UMICORE	Belgium
5	LV	LIONVOLT B.V.	Netherlands
6	TNO	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	Netherlands
7	FHG	FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.	Germany
8	CCI	CUSTOMCELLS HOLDING GMBH	Germany
9	RWTH	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	Germany
10	MIMI	MIMI TECH GMBH	Germany
11	IFPEN	IFP ENERGIES NOUVELLES	France
12	PVS	PIPISTREL VERTICAL SOLUTIONS DOO PODJETJE ZA NAPREDNE LETALSKE RESITVE	Slovenia
13	LDO	LEONARDO - SOCIETA PER AZIONI	Italy
14	FEV	FEV EUROPE GMBH	Germany
15	EDLP	FEV eDLP GmbH	Germany
16	ZAB	ZABALA INNOVATION CONSULTING, S.A.	Spain



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