



ADVAGEN

DELIVERABLE REPORT



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Development of ADVAnced next GENeration Solid-State batteries for Electromobility Applications
GA n° 101069743

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DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patents filing, press & media actions, videos, etc.	

Dissemination Level		
PU	Public	X
SEN	Sensitive	

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Project summary

This report is part of the deliverables from the project "ADVAGEN" (Development of ADVANCED next GENERATION Solid-State batteries for Electromobility Applications), which has received funding from the European Union's Horizon Europe research and innovation program under grant agreement No. 101069743.

To date, the battery market is dominated by lithium-ion (Li-ion) chemistries, as the energy density has more than doubled and their costs have dropped by a factor of at least 10. However, conventional Li-ion batteries (LIB) are reaching their performance limits in terms of energy density and facing safety issues, therefore the development and production of new battery generations is required, such as Solid-State Batteries (SSBs), to create a new industry value chain in Europe towards their commercialization. Consequently, high-energy-density EU-made SSBs will ensure the supply of, among others, the automotive sector. To do so, the development and deployment of new manufacturing technologies, enabling the largescale production of SSBs, is crucial. Indeed, among the overarching themes to develop and produce sustainable batteries in the future, the BATTERY 2030+ roadmap⁴ considers manufacturability as a cross-cutting key area. Innovative and scalable manufacturing techniques to produce SSBs will accelerate cost reduction, energy savings, and enhanced safety. ADVAGEN will develop a new lithium metal (LiM) battery cell technology based on a safe, reliable, and high performing hybrid solid-state electrolyte (LLZO-LPS based), gaining a competitive advantage over the worldwide (mainly Asian) competition. This will sustainably strengthen the EU as a technological and manufacturing leader in batteries as specified in the ERTRAC electrification roadmap and SET-Plan Action Point-7. ADVAGEN consortium contains key EU actors in the battery sector, from industrial materials producers (SCHT, CPT, ABEE), battery manufacturer (ABEE) to R&D centers (IKE, CEA, IREC, TUB, CICE, POLITO, INEGI, UL, FEV) and the automotive industry (TME), covering the complete knowledge and value chain. By developing high-performance, affordable, and safe batteries, ADVAGEN aims to re-establish European competitiveness in battery cell production.

More information on the project can be found at <https://www.advagen.eu/>

Objective and Executive summary

This deliverable constitutes ADVAGEN project handbook and contains all related information for managing and running the project, including the procedures to be followed, the quality assurance processes, and the deliverables and milestones. It also provides details of the partners, the means they will use to communicate and make decisions and the boards and committees established in ADVAGEN to effectively manage and advise on the technical aspects of the project.

This deliverable is meant to be used by the consortium members as a point of reference on finding the appropriate deadlines, and procedures to support its management, ensuring quality and effective communication between the partners, to lead to a successful completion of the project.

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List of abbreviations

AB	Advisory Board
Ah	Ampere-hour
EOSC	European Open Science Cloud
EU	European Union
GA	General Assembly
Q&A	Questions & Answers
LiM	Lithium metal
WP	Work package
WPL	Work Package Leaders
WPLB	Work Package Leaders Board

Introduction

The project management plan aims at ensuring the administrative, financial, and technical management of the project, including information on the deliverables, milestones, and templates to be used, communication platform details and procedures to be followed in ADVAGEN. It also provides the details of all partner's information.

The objectives of this deliverable are therefore to provide:

- Rules, best practices, and procedures to be adopted and followed in ADVAGEN for the successful management of the project,
- Templates to be used for the deliverables, reports, or presentations for the ADVAGEN project,
- The communication platforms to be used for effective communication and collaboration between partners,
- The deliverables and milestones produced during the project and the procedure to be followed so that they are consistent and of good quality,
- The details of all partners and their information.

In addition, this deliverable provides the risk management and mitigation strategies and the quality assurance process adopted by the project's consortium. It also provides details on the boards and committees established in ADVAGEN to effectively manage and advice on the technical aspects of the project.

1. The ADVAGEN CONSORTIUM

1.1. List of partners

The ADVAGEN consortium (see Table 1) consists of 14 partners from 9 EU countries.

Table 1: list of ADVAGEN partners

N°	Name	Short name	Country
1	AVESTA BATTERY & ENERGY ENGINEERING	ABEE	Belgium
2	INEGI - INSTITUTO DE CIENCIA E INOVACAO EM ENGENHARIA MECANICA E ENGENHARIA INDUSTRIAL	INEGI	Portugal
3	POLITECNICO DI TORINO	POLITO	Italy
4	FEV EUROPE GMBH	FEV	Germany
5	COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVE	CEA	France
6	TECHNISCHE UNIVERSITAET BRAUNSCHWEIG	TUBS	Germany
7	CENTRO DE INVESTIGACION COOPERATIVA DE ENERGIAS ALTERNATIVAS FUNDACION, CIC ENERGIGUNE FUNDAZIOA	CIC energigUNE	Spain
8	FUNDACIO INSTITUT DE RECERCA DE L'ENERGIA DE CATALUNYA	IREC-CERCA	Spain
9	TOYOTA MOTOR EUROPE NV	TME	Belgium
10	UNIVERZA V LJUBLJAN	UL	Slovenia
11	EUROQUALITY SARL	EQY	France
12	TECHCONCEPTS BV	TC	Netherlands
13	CERAMIC POWDER TECHNOLOGY AS	CERPOTECH	Norway
14	IKERLAN S. COOP	IKERLAN	Spain

1.2. Partners & competencies

As shown in the Figure 1 below, the competencies of ADVAGEN partners are highly complementary. This table also presents the global competence required to achieve the objectives of the project.

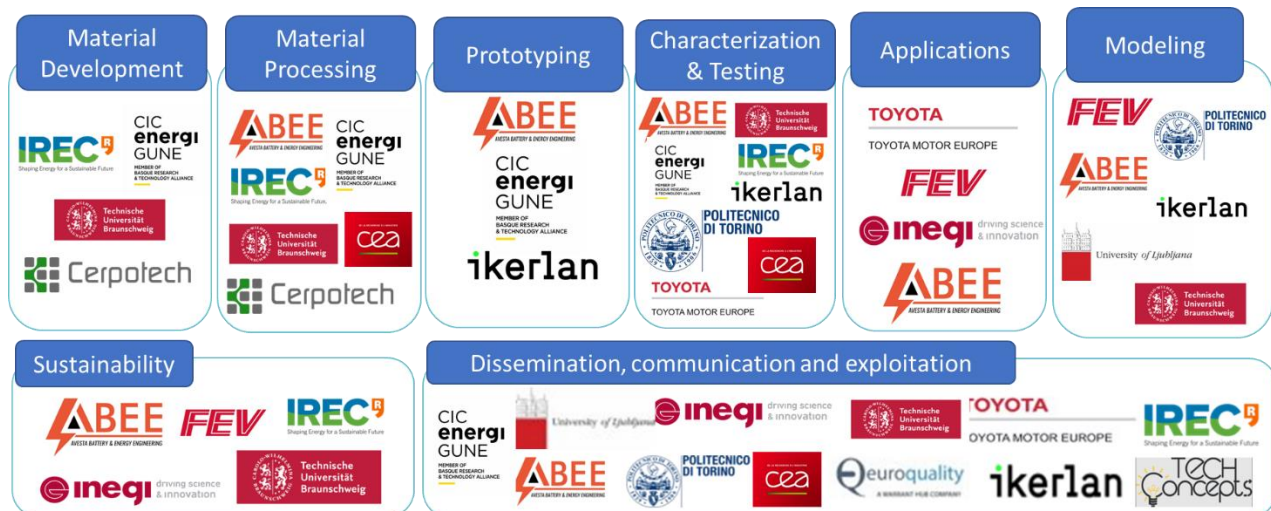


Figure 1: ADVAGEN partners main competencies

2. PROJECT STRUCTURE

2.1. Work plan structure

The ADVAGEN work plan is organized into 8 Work Packages (see Figure 2 below):

- WP1: Project Management & Technical coordination
- WP2: Application & cell requirements
- WP3: Materials development & interface optimization
- WP4: Small & Large cell Prototyping
- WP5: Cell testing & Safety assessments
- WP6: Multiscale Modeling
- WP7: Life cycle assessment, Cost assessment, Recycling
- WP8: Communication, dissemination, exploitation & Networking activities

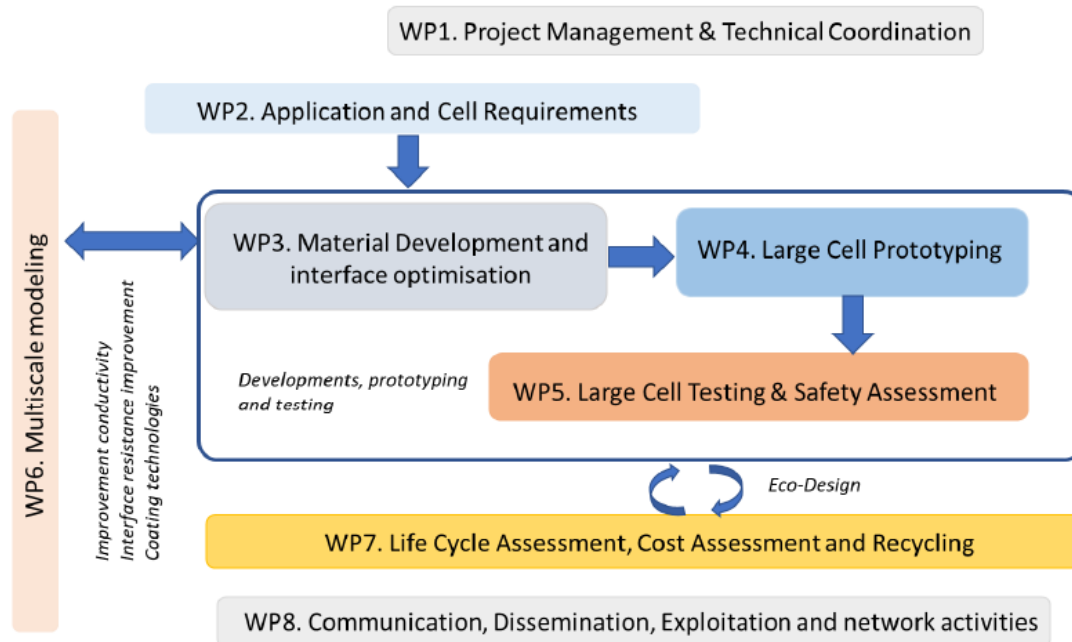


Figure 2: ADVAGEN Work Package structure

Project management and quality assurance activities have been concentrated in WP1, which will run throughout the entire duration of the project. Communication, dissemination, exploitation, and networking activities also constitute a distinct work package, WP8, which will also be active throughout the project. WP1 and WP8 will run in parallel and interact with the technical and demonstration phases at every stage of the project.

In ADVAGEN, the development of a new lithium metal (LiM) battery cell technology will be performed in three steps:

STEP 1 will start with the development of hybrid solid state electrolyte (oxide and sulfide) to reach the required conductivity. In addition, the Ni-rich cathodes will be developed, in parallel with lithium metal with proper coating based on metallic oxides. In this pillar, clear attention will be devoted to interface optimization through new combined operando characterization techniques with high time and spatial resolution for materials' selections. The multiscale modelling will play a key role to predict the right ratio of sulfide and oxide to achieve the required performances.

STEP 2 will prototype the small (up to 1Ah) and large cells (10Ah) in pouch format to assess the material scalability and performances. The large cells will be prototyped based on ABEE industrial pilot line that is specifically designed for solid state technology.

STEP 3 will focus on the performance, safety, and aging evaluation of the large battery cells (10Ah) based on the defined KPIs and test procedures. Along this pillar, a new battery module/pack (51V, 10Ah) based on ADVAGEN large battery cells will be designed and developed to support the cost assessment study. In addition, ADVAGEN will consider a dedicated roadmap towards higher TRL level of the developed battery

cell technology. In ADVAGEN, the sustainability is one of the key objectives and therefore, the recycling and LCA will be extensively analysed.

2.2. Management structure

The ADVAGEN project management structure has been agreed among the partners to ensure effective project control with minimal management overhead. The organisational structure and decision-making mechanisms have been formalised in the Consortium Agreement. The roles of the management structure are detailed below:

Project coordinator: ABEE, as the coordinator of the project, is the legal entity acting as the intermediary between the consortium members and the granting authority.

Work Package Leaders (WPL): A board constituted by at least one representant of each consortium member leading a work package will constitute the supervisory body for the execution of the project. The Work Package Leaders Board (WPLB) shall report to and be accountable to the General Assembly (see below). The WPL deal with the technical development and overall coherence and technical implementation of the project output in their respective WP. The WPLB will meet virtually once a month to discuss the progress made during the past month, plan the coming activities, and discuss any issues.

Project management support team: represented by EQY, the team will support the coordinator, the consortium, the General assembly and the WPLB with managerial, organizational, and secretarial duties, administration, and archiving work.

2.2.1. General Assembly

The General Assembly (GA) is the decision-making body of the project, chaired by the Project Coordinator and composed of one representative of each partner organization (each with one vote), allowing for participation of each partner in the decisions of the project. The GA is responsible for the strategic orientation, budget revisions and measures taken to manage risks. To ensure timely progress and quality, and adapting as necessary to external changes, the GA analyses performance indicators and all other relevant information and considers the evolution of the context in which the project is carried out, notably scientific, legal, societal, and economic. The GA meets at least twice a year. Additional intermediate meetings may be in the project's interest. In this case, GA meetings are held by decision of the WPLB or by the request of 1/3 of its members. In between meetings, the GA can take decisions by electronic means. The GA is the ultimate decision-making body and tries to reach consensus whenever possible. In the opposite case, the GA makes decisions upon simple majority with a casting vote.

2.2.2. Advisory Board

The main role and responsibilities of the Advisory Board (AB) are to advise on social, ethical, privacy, technical and innovation issues and monitor progress in the tasks and the production of the different outputs and deliverables, when requested by the WPLB. AB members will participate in project events as required, will contribute to the requirements and review project results.

2.2.3. Conflict resolution

A clear decision-making procedure will allow a simple conflict resolution process. A hierarchical approach is followed: *i)* first, the effort is to resolve the conflict at task or WP level; *ii)* if this is not possible, the conflict is discussed at the WPLB meeting and consensus is sought after to solve the problem; *iii)* if the problem cannot be solved it is escalated to the GA where the respective WPL prepares a description of the problem and its possible solutions; *iv)* if the problem cannot be solved by consensus in the GA then voting takes place, requiring a simple majority with a casting vote for the Project Coordinator.

The voting rules and quorum are detailed in the Consortium Agreement of the project.

3. Internal collaboration, communication, and project meetings

To ensure effective collaboration and communication between partners, an easily accessible and reliable communication infrastructure has been created. As a proposition from EQY validated by the other partners, the consortium decided to use Teams as both communication tool for meetings and repository platform with secured access for each participant. The tools used will be adapted to the different uses and targeted audiences.

3.1. Email and mailing lists

Partners will communicate with each other through direct emails or telephone/web calls in the cases where only a subset of the consortium partners needs to be reached or where sensitive or critical information needs to be communicated. Mailing lists constitute an important communication tool used in ADVAGEN; and all mailing lists are private with members-only access to them.

The mailing lists are created using the webmail services “GANDI” and are managed and updated by EQY.

To increase accessibility and impact of the project and to make sure external contact is available and centrally managed, a general e-mail address info@advagen.eu has been created. This general e-mail address can be linked to the personal e-mail addresses of representatives from different partners involved in the project management. Currently, the e-mail address is linked to private e-mail addresses of ABEE’s and EQY’s personnel involved in the project, but the list of recipients can be updated upon partners’ demand.

The general e-mail address will be featured in the “Contact Us” section of the ADVAGEN website to be accessible to the general public.

3.2. Shared space

All partners in the consortium are using the Microsoft Office suite, granted by their organisation. They can therefore access the repository with their Office ID through either a desktop application (Teams) or a webpage (shared with partners).

The repository of the ADVAGEN project is organized as follows (Figure 3):

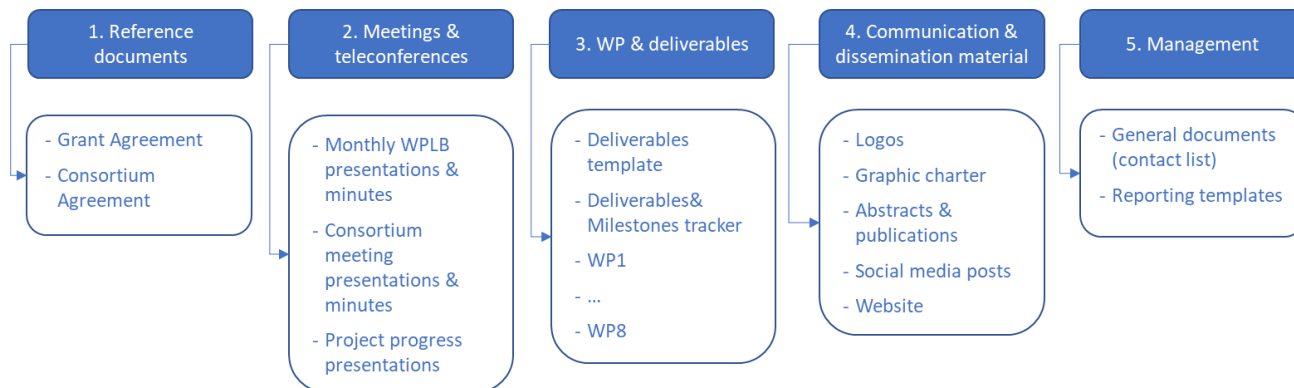


Figure 3: ADVAGEN SharePoint organisation

3.3. Project meetings & teleconferences

The Microsoft Teams environment allows to create teleconference meetings between partners, such as Management meetings, Work Package Leader Board meetings, Monthly Progress meetings, Consortium Meetings, bilateral or multilateral technical meetings. All partners have access to this service either through their respective organisations or through granting access by EQY.

3.3.1. Consortium meetings

The project consortium meetings will take place physically every 6 months or remotely on demand. Remote meetings will be held periodically and depending on the needs and the agreements between the various WP partners during the face-to-face project meetings.

The agenda of the meeting will be prepared by ABEE, EQY and the partner hosting the meeting, and circulated in advance. With the support of EQY, the organiser of a meeting is responsible for setting up a Doodle (or equivalent) means for establishing each partner's availability, as well as keeping and sharing the minutes.

An email with the link to access the meeting (remotely) will be sent to the partners.

3.3.2. Monthly WPLB meetings

In order to ensure a regular follow-up of the progresses done by partners in the project, the WPLB will gather monthly. This Monthly Progress Meeting is set to occur every first Thursday of the month at 10:00

CET and to last a maximum of 1 hour. ABEE and EQY oversee the smooth organisation of the meeting, during the exchange as well as upstream and downstream. The Monthly meeting presentation template is the key document for this meeting. It is structured with a first section aimed at reminding partners of the project's schedule and upcoming milestones, followed by one section per Work Package (all tasks), a reminder section of the deliverables due in the following 6 months, and a Q&A session.

Ahead of the meeting, ABEE and EQY will be in charge of updating a deliverables & milestones tracker available on the Sharepoint, with the status of each deliverable and milestone: *i.e.* skeleton ready, first draft ready and circulating, final version of the deliverable ready.

3.3.3. Monthly management meetings

Monthly management meetings will take place between ABEE and EQY every first Monday of the month at 10.00 CET and will last maximum one hour.

The goal of the management meetings is to ensure a smooth and efficient management of the different aspects of the project and transversal topics, including:

- Feedbacks from WP leaders on the progress of the project and of the deliverables
- WP leaders' specific requests
- Upcoming activities
- Communication needs and opportunities

3.3.4. Work package meetings

Work Package meetings are organized regularly between the WP leader and the partners participating in the WP. End-users of the WP output will also be invited.

The main goal of these meetings is to ensure all partners involved in the same WP are progressing on their tasks in a coherent and efficient way. In addition, WP meetings enable the partners to discuss matters related to their Work Packages on a more detailed level than the Monthly Meeting, especially on technical matters.

A channel dedicated to each WP has been set on Teams, allowing partners to discuss specifically on the matters of the WP.

4. External communication

The communication strategy of the project comprises a set of activities that will communicate the projects progresses and results to relevant target audiences and attract interest in the project. It is recognised that there are four main communication channels:

- Person-to-person (workshops, presentations, etc.);
- Written/printed channels (newsletters, posters, etc.);
- Technology-based online channels (Internet, social media, etc.).
- Traditional media

The ADVAGEN consortium will engage in communication activities across all these channels.

4.1. Logo of the project

The ADVAGEN logo was designed during the setting up phase of the project and was also presented during the kick-off meeting by ABEE/EQY and was approved by all partners. It will be used in all documentation and external communication. It is available for all members in the sharing space in the following styles/colours:



Figure 4: ADVAGEN logo

4.2. Website of the project

Naturally, the online presence of the project will revolve around a central website, which will be live throughout the project's duration, as well as for at least a period of six years after the project has finished. As the centrepiece of the project's online presence, the website will not only make available public results and interesting news of the project but will also provide an environment for online collaboration within ADVAGEN consortium. Importantly, it will also provide direct and suitably emphasised links to the other forms of online presence of the project, such as social media, blogs, technical forums, and individual related events focussing on communication. The URL of ADVAGEN's website is: <https://www.advagen.eu/>.

4.3. Social media, blogs and forums

ADVAGEN will have very active presence in social media, especially at decentralised and community-based level for communicating project results, evaluating ideas and seeking feedback. Special attention will be given to professional social media tools such as LinkedIn and to general purpose (e.g. non-professional) social media such as twitter. The presence on Twitter can help maximise visibility at societal level and increase the likelihood of attracting the attention of traditional media as well.

- LinkedIn account: <https://www.linkedin.com/company/he-advagen/>
- Twitter account: <https://twitter.com/HEAdvagen>

Blogs and technical forums: The project will regularly publish information about the project and ongoing developments, not only of the individual technical innovations, but also of the technical and non-technical challenges involved. The partners have considerable experience in making good use of web-based platforms for publicising research and innovation results. As part of the dissemination task, the project will also analyse the appropriate types of public technical and nontechnical forums and other project's or other organisations' blogs, where participation will maximise visibility and potential for impact.

4.4. Scientific publications

Project participants may prepare scientific publications based on their work in the project. When one or more partners intend to submit a publication or participate in presentations or demos/exhibitions related to work performed within the ADVAGEN project, they need to inform the WPLB and the consortium members 45 calendar days before the submission, by sending an email to them with the necessary information about the publication (title, authors, abstract) to seek approval. Any objection and modification requests from consortium members must be made in writing to the WPLB within 30 calendar days from receiving the request and discussions on how to overcome the objections on a timely manner will take place. An approval from the WPLB in the form of an email is needed before proceeding to the submission.

All of these publications will be submitted to journals that allow immediate open access and peer-reviewed publications will be also submitted to trusted repository with immediate open access.

Any dissemination of results in academic or other publications must be declared to the WPLB to be documented and recorded at the ADVAGEN website and in the European Open Science Cloud (EOSC) and/or project-specific database enabling storage, sharing, processing, analysis, and re-use of research outputs (data and software) across borders and disciplines.

All dissemination and communication material should include:

- The acknowledgement of EU funding “*This project has received funding by the European Union’s Horizon Europe research and innovation programme under the grant agreement No. 101069743 (ADVAGEN)*”,
- The disclaimer excluding EC responsibility: “*Views and opinions expressed are those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them*”.
- The European Union’s emblem presented below:



4.5. Communication events

The project will participate in large-scale industrial and networking events, e.g., on solid-state batteries, electric mobility, grid stability and with the Mission Innovation HIGH-POWER ALL-SOLID-STATE BATTERIES to demonstrate the project results and technical solutions. In particular, ADVAGEN is planning to organise two events gathering industrials of the sector (one at M24, one at M48) to increase stakeholder visibility of the project. Targeted industry clusters are: Advanced Materials Cluster (MAV) from the Agency for Business Competitiveness at Catalonia; Battery manufacturers and Battery materials producers; CFI - ceramic forum international; Refractories WORLDFORUM; Ceramic Applications; EARPA.

Additionally, communication with other projects researching in the same areas as ADVAGEN will be exploited, in order to maximise impact using online social media (i.e., mutually following project activities and disseminating events).

4.6. Promotional material

ADVAGEN kakemono, flyers and brochures will present summarised information regarding the project’s results and achievements. The emphasis here is on producing information that is easy to digest. Also, posters will be presented in conferences, workshops, and exhibitions. Promotional material will also include traditional newsletters, leaflets, and press releases.

5. Project monitoring and reporting

The coordinator will be responsible for keeping track of the budgeting of the project and each partner and submit periodic reports to the Commission. This will help in the efficient monitoring of the project and identifying any possible deviations from the planned targets.

5.1. Periodic and final progress reports / Internal monitoring

Periodic activity reports shall be submitted to the Commission by the Coordinator at M18, M36 and M48. These reports detail the work performed by the partners, the achievements, collaborations, resources spent/planned, and future plans and, together with the Financial Statements, will serve as the main Project Management documentation. In between the periodic reports, there will be internal yearly reports for the coordinator to keep track of the project performance.

The project coordinator requires a breakdown of expenditure from each partner every 12 months, according to the dates below (Table 2). This will be in the form of a spreadsheet.

The spreadsheet will be provided by ABEE/EQY and will include a breakdown of the following costs throughout each 12-month period:

- Individual staff costs and their Person Month for each Work Package,
- Travel costs,
- Equipment, Consumables and other costs,
- Technical progress, achievements, problems and remedial actions.


Table 2: Internal reporting periods

Internal reporting period	Start	End	Month	Due date
1	01/08/2022	31/07/2023	12	31/09/2023
2	01/08/2023	31/07/2024	24	31/09/2024
3	01/08/2024	31/07/2025	36	31/09/2025

4	01/08/2025	31/07/2026	48	31/09/2026
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5.2. Timesheet template

For each month of the project, a detailed template (see below Figure 5) is proposed to monitor the time per person and per Work Package per week. The first table at the top of each month summarizes the total effort of the partner for the month considered. The proposed template has been developed by EQY and shared with all partners. It will be used by those partners who do not already have an internal hour registration system capable of monitoring personnel time in such a manner that meets the degree of details needed for reporting. Therefore, the use to the proposed template is not mandatory for partners with a personnel time monitoring system already internally in place.

	Project Acronym	ADVAGEN							
	Grant Agreement number	101069743							
	H2020 Call Reference	HORIZON-CL5-2021-D2-01							
	Timesheet Month & Year	Aug-22							
Work Packages	01/08	08/08	15/08	22/08	29/08	TOTAL hours	TOTAL PM	Personnel Costs	
Project Management and Technical Coordination	0	0	0	0	0	0	0,00	0,00	
Application and cell requirements	0	0	0	0	0	0	0,00	0,00	
Materials development and interface optimization	0	0	0	0	0	0	0,00	0,00	
Small & Large Cell Prototyping	0	0	0	0	0	0	0,00	0,00	
Cell testing & safety assessments	0	0	0	0	0	0	0,00	0,00	
Multiscale Modeling	0	0	0	0	0	0	0,00	0,00	
Life Cycle Assessment, Cost Assessment, Recycling	0	0	0	0	0	0	0,00	0,00	
Communication, dissemination, exploitation and networking	0	0	0	0	0	0	0,00	0,00	
Total number of hours to be charged to this project	0	0	0	0	0	0	0,00	0,00	

Project Acronym	ADVAGEN							
Grant Agreement number	101069743							
H2020 Call Reference	HORIZON-CL5-2021-D2-01							
Person carrying out work	0							
Category (scientist, technician, administrator etc)	0							
Hourly rate (€) (€)	0,00							
Timesheet Month & Year	Aug-22							
Work Package	01/08	08/08	15/08	22/08	29/08	TOTAL hours	TOTAL PM	Personnel Costs
Project Management and Technical Coordination						0	0,00	0,00
Application and cell requirements						0	0,00	0,00
Materials development and interface optimization						0	0,00	0,00
Small & Large Cell Prototyping						0	0,00	0,00
Cell testing & safety assessments						0	0,00	0,00
Multiscale Modeling						0	0,00	0,00
Life Cycle Assessment, Cost Assessment, Recycling						0	0,00	0,00
Communication, dissemination, exploitation and networking						0	0,00	0,00
Total number of hours to be charged to this project	0	0	0	0	0	0	0,00	0,00

Signature of Person carrying out work:


Signature of Supervisor:

Date: _____

Date: _____

Figure 5: ADVAGEN timesheet reporting table

In the last sheet, all the costs are compiled and Person-Months (PMs) as well as personnel costs per WP and total are gathered as shown below (Figure 6). The planned figures should also be included by partners in order to compare the current time spent and costs to the initial plan.

Summary for periodic report								
	Project Acronym		ADVAGEN					
	Grant Agreement number		101063743					
	H2020 Call Reference		HORIZON-CL5-2021-D2-01					
	Reimbursement rate		100%					
Work Packages	A. Direct personnel costs		D. Other direct costs			E. Indirect costs	Total costs declared	
	Person/months	Personal costs	Subcontracting	Travel	Equipment			Other goods and services
Project Management and Technical Coordination	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Application and cell requirements	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Materials development and interface optimization	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Small & Large Cell Prototyping	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Cell testing & safety assessments	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Multiscale Modeling	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Life Cycle Assessment, Cost Assessment, Recycling	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
Communication, dissemination, exploitation and networking	0,00	0,00	0,00	0,00	0,00	0,00	0,00	
TOTAL	-	-	-	-	-	-	-	

Project Management and Technical Coordination									
A. Direct personnel costs		B. Subcontracting	D. Other direct costs			E. Indirect costs	Total costs	Reimbursement rate	TOTAL
Person/months	Personal costs	Subcontracting	Travel	Equipment	Other goods and services				
Current									
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100%	-
Initially planned in the estimated budget									
						0,00	0,00	100%	-
Remaining									
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	Not relevant	0,00

Application and cell requirements									
A. Direct personnel costs		B. Subcontracting	D. Other direct costs			E. Indirect costs	Total costs	Reimbursement rate	TOTAL
Person/months	Personal costs	Subcontracting	Travel	Equipment	Other goods and services				
Current									
0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100%	-
Initially planned in the estimated budget									
						0,00	0,00	100%	-
Remaining									
0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	Not relevant	0,00

Materials development and interface optimization									
A. Direct personnel costs		B. Subcontracting	D. Other direct costs			E. Indirect costs	Total costs	Reimbursement rate	TOTAL
Person/months	Personal costs	Subcontracting	Travel	Equipment	Other goods and services				
Current									

Figure 6: Total PM and costs

5.3. Project documents and deliverables

The deliverables, milestones and tasks are described in the Grant Agreement document. The Table 3 below provides the deliverable list in chronological order to allow easier monitoring for the coordinator and an easier point of reference for the partners.

Table 3: List of deliverables

Del. No.	Deliverable title	WP	Leader	Due date	Type*	Diss. Level**
D1.1	Project Management Plan	1	EQY	3 (31/10/2022)	R	PU
D1.2	Data management plan (DMP)	1	ABEE	6 (31/01/2023)	R	SEN
D2.1	End-user driven specifications	2	TME	6 (31/01/2023)	R	SEN
D8.1	Plan for dissemination and exploitation including communication activities	8	EQY	6 (31/01/2023)	R	SEN

D8.2	Website	8	ABEE	6 (31/01/2023)	DEC	PU
D2.3	Protocols for the testing of labscale, small cells and large cells	2	POLITEC	9 (30/04/2023)	R	SEN
D7.1	Digital Data Platform - User Manual	7	INEGI	12 (31/07/2023)	R	PU
D3.1	Hybrid oxide-sulfide electrolyte - properties and processing	3	TUBS	18 (31/01/2024)	R	SEN
D6.1	Mechanistic process model	6	TUBS	18 (31/01/2024)	R	SEN
D8.4	Intermediate plan for dissemination and exploitation including communication activities	8	EQY	18 (31/01/2024)	R	PU
D3.2	Electrochemically stable electrodes for sulfide-based cells: nickel rich NMC-based cathode and Li metal anodes	3	ABEE	21 (30/04/2024)	R	SEN
D2.2	Eco-design guidelines	2	INEGI	24 (31/07/2024)	R	PU
D4.1	Large pouch cell prototype cell design & assembly definitions	4	TUBS	24 (31/07/2024)	R	SEN
D6.2	Mesosopic model for analyzing interfacial phenomena and bulk cathode material	6	UL	24 (31/07/2024)	R	SEN
D3.3	Materials validation in coin cells and optimization of solid-solid interfaces by operando techniques	3	CIC energigUNE	26 (30/09/2024)	R	SEN
D4.2	Electrodes and separator strips manufacturing	4	CEA	26 (30/09/2024)	R	SEN
D7.3	Recycling process flow design	7	ABEE	28 (30/11/2024)	R	SEN
D4.3	10 Ah prototype cell manufacturing	4	ABEE	36 (31/07/2025)	R	SEN
D4.4	Design of 51V battery module	4	IKERLAN	36 (31/07/2025)	R	SEN
D6.3	Model of the Elementary electrochemical cell	6	UL	36 (31/07/2025)	R	SEN
D7.4	Report on experimental recycling process	7	ABEE	44 (31/03/2026)	R	SEN
D6.4	Physicochemically consistent equivalent circuit models for advanced model supported analyses of prototype cell	6	FEV	46 (31/05/2026)	R	SEN
D7.2	Sustainability & Circularity Assessment studies for Battery Manufacturing	7	INEGI	46 (31/05/2026)	R	SEN
D1.3	Data Management Plan (DMP)_final	5	ABEE	48 (31/07/2026)	R	PU
D5.1	Small and large cells performance and safety validation	5	ABEE	47 (30/06/2026)	R	PU
D5.2	Cell ageing and validation of mechanisms from WP4	5	IREC	48 (31/07/2026)	R	PU
D5.3	Post Mortem Analysis of 1Ah pouch cells	5	IREC	48 (31/07/2026)	R	SEN
D5.4	Roadmap towards higher TRL	5	POLITO	48 (31/07/2026)	R	PU
D5.5	Prototype and validation of 51V battery module	5	IKERLAN	48 (31/07/2026)	DEM	PU

D8.3	Report on networking activities and roadmap to higher TRLs	8	TC	48 (31/07/2026)	R	SEN
D8.5	Final plan for dissemination and exploitation including communication activities	8	TC	48 (31/07/2026)	R	PU

*R: Document, report; DEM: Demonstrator, pilot, prototype; DEC: Websites, patent filings, videos **PU: Public; SEN: Sensitive

The Table 4 below presents an overview of the major milestones set within ADVAGEN. They constitute control points, where a crucial outcome will have been achieved, or a major decision will have been taken. The timely achievement of the listed milestones will indicate the proper progress of the project.

Table 4: List of milestones

MS. No.	Milestone title	WP	Leader	Due date	Means of verification
19	Website online	8	ABEE	6 (31/01/2023)	The website is available in relevant EU languages
1	Cell test protocols	2	POLITO	9 (30/04/2023)	Report available by means of deliverable D2.3
16	Matured Digital Data Platform	7	INEGI	9 (30/04/2023)	Platform available and validated for use
6	Delivery of 2kg for ceramic & 2kg for sulfide	4	TUBS	12 (31/07/2023)	Reception of materials at ABEE
7	Delivery of 7.5kg cathode for exploring the best material composition (NMC 811 & Mg doped)	4	CERPOTE CH	12 (31/07/2023)	Material delivered
2	Hybrid oxide-sulfide electrolyte in pellet form and laminates	3	TUBS	18 (31/01/2024)	Demonstrated and validated at lab level and by means of D3.1
5	Selection of best composition to keep ongoing studies of electrode processing (task 3.2) and material combination (task 3.4) for final cell chemistry mainly	3	CIC energiGU NE	19 (29/02/2024)	Best material composition selected
3	High voltage positive electrode with oxide/ sulfide catholyte	3	ABEE	21 (30/04/2024)	Analysed and demonstrated by means of D3.2
8	Delivery of 7kg for ceramic & 7kg for sulfide for prototyping large cells	4	TUBS	23 (30/06/2024)	Material delivered
9	Delivery of 25kg cathode for large cells prototyping	4	CERPOTE CH	23 (30/06/2024)	Material delivered

4	Stable Li metal films deposited on Cu collector	3	ABEE	24 (31/07/2024)	Demonstrated and validated at lab level by means of D3.2
15	Mesoscopic model for analyzing interfacial phenomena and bulk cathode material	6	UL	24 (31/07/2024)	Model available and validated against experimental results
12	Defining requirements and design battery module	4	ABEE	28 (30/11/2024)	Design defined and model delivered
18	Defined process flow for experimental recycling.	7	ABEE	28 (30/11/2024)	Means of verification by deliverable 7.3
17	Baseline life cycle environmental and economic characterization	7	INEGI	30 (31/01/2025)	Inventoried data available in the Digital Data Platform to all users
10	Electrode and electrolyte layers delivery for manufacturing	4	ABEE	31 (28/02/2025)	Electrodes and electrolyte delivered
11	40 units of 10Ah cells available for testing	4	ABEE	36 (31/07/2025)	Reception of cells by testing partners for performance, aging and safety analysis
13	Full testing of small cells (1Ah) complete	5	POLITO	36 (31/07/2025)	Performance, ageing mechanisms, safety and post mortem analysis data gathered
14	Complete data set about performances, ageing mechanisms, safety and post mortem characterization of small (1Ah) and large (10Ah) cells	5	POLITO	46 (31/05/2026)	All corresponding data gathered and available for Roadmap writing (D5.4)
20	Exploitation plan	8	TC	48 (31/07/2026)	D8.5 accepted by all partners. As D8.5 is the Final plan for dissemination and exploitation including communication activities

6. Quality assurance

Quality assurance will be performed throughout the duration of ADVAGEN to ensure the quality of the project and the relevant documentation. Task 1.1 of WP1 coordinates the review of all deliverables. This

task assigns internal reviewers for each deliverable. Following are some review guidelines to ensure consistent high quality concise deliverables that clearly show the work being carried out by the project.

Comprehensive deliverables handling and review procedures were defined during the first WPLB meeting, presented during the kick-off meeting and agreed by all partners, including: i) the deliverable template, ii) deliverable preparation schedule and iii) the review and approval process before delivery, including the appointment of specific internal reviewers for each deliverable.

6.1. Deliverable template

Templates for deliverables and presentations, to be followed by all partner, have been created by EQY. These were distributed to the partners and are available on the shared space. The ADVAGEN logo to be used in all official communication was also created by EQY.

6.2. QA for deliverables

Deliverables will be elaborated as a joint effort among the partners involved in the related WP. Their completion will be under the responsibility of the relevant WPL, who will be assisted by the Deliverable Leader when different and will count on contributions from other partners.

For the internal review, each WPL will send the skeleton of the deliverable (i.e. plan of content) to the reviewing team 2 months ahead of the due date, and a near-final draft 1 month ahead of the due date. After the reviewing process, the coordinator will act as the final quality check before the submission of the deliverable.

The content of each deliverable report depends on the type of provided information. As a general principle, the responsibility for the content of each deliverable report is always with the author(s). Nevertheless, the reports should always meet a set of requirements. These requirements result in a set of quality criteria for project deliverable reports. Information must address all aspects related to the purpose for which research is conducted and the information is produced. On the other hand, a redundancy of information must be avoided, as in some cases it might obscure the clarity of research findings.

CRITERION 1: Completeness

Information provided in the deliverable report, must be reliable and must correspond with reality. This means that all background information used in the reports should be appropriately supported by references. Foreground information should be supplied in a clear fashion and be sufficiently supported, such that misinterpretation will be avoided.

CRITERION 2: Accuracy

Information used in the deliverable report should be focused on the key issues and be written in a fashion that takes into consideration the scope of the specific research work and its target audience.

CRITERION 3: Relevance

All information used should be provided to the depth needed for the purpose of the reports.

CRITERION 4: Appearance and structure

Although deliverable reports will be authored by different partners within the framework of ADVAGEN, it is important that reports are prepared with uniform appearance and structure, such that they appear as originating from a single initiative. It is therefore necessary to observe the Project Deliverable Template which specifies the structure, organization of content, lay out and appearance of project deliverable reports.

CRITERION 5: Adherence to standards of quality

CRITERION 6: Writing features

Prompt supply of information. The information must be provided in relation to the particular phase of the project’s development and according to the Description of the Actions.

CRITERION 7: Punctuality

Deliverables must be submitted to the European Commission in due time, according to the delivery dates mentioned in the Grant Agreement and in the Table 3.

7. Risk management

The ADVAGEN work plan has been carefully designed to ensure a consolidated view of the envisioned system concept. In the case of unlikely adverse events, the project defines mechanisms for risk management. To react promptly to major deviations of the work plan, the consortium will rely on the information flow within the project.

The management structure has been defined in order to include regular progress reviews and the assessment of measurable results. This will ensure the consortium capability for a very early assessment of possible deviations from the expected results, schedule, and the possibility to put in place the appropriate corrective actions. The risk management process includes identification, evaluation, reduction actions, monitoring and revisions (continuous revision of the risk plan during the entire project duration) and success/failure feedback.

Some initial strategic, organisational, and technical risks have been identified and discussed by the consortium, and a possible contingency solution is formulated for each of them, as seen in Table 5.

Table 5: Critical implementation risks and mitigation plan

Risk No.	Description of risk	WP	Proposed mitigation plan
1	Delay in the supply or lack of raw material (likelihood - low, severity - high)	All	Partners will diversify the sources of supply to ensure that tension on the market or other issues will not impact the progress of the project.

2	Infringe on existing patents (likelihood - medium, severity - medium)	All	ABEE & TME will scan the IP environment worldwide and update the consortium in a timely manner. Risk of infringement could be avoided by adapting project development trajectory.
3	Materials scale-up does not reach the targeted levels of production (likelihood - low, severity - high)	WP3, WP4	Early considerations on required efforts in production upscaling to 10 kg range already during material development and derive changes. Decrease the upscaling target mass and preparation of smaller batches to supply to provide the required material amount.
4	LiM is unable to meet the fast charging requirement (likelihood - medium, severity - medium)	WP3, WP4	Change: the surface treatment based on various ABEE technologies such as polymer or oxide based coating, charging protocol.
5	Solid Electrolyte cannot fulfil the conductivity requirement (likelihood - medium, severity - medium)	WP3, WP4	Change ratio of ceramic and sulfide and modify the functionalities introduced into the polymer structure in order to decrease the interface resistance between the components and improve the lithium conduction path. The multiscale modelling will predict the optimal ratio scenario.
6	Solid electrolyte/electrode interfacial resistance cannot meet the target (likelihood - low, severity - medium)	WP3, WP4	Change in the processing method, application of external pressure, screening of electrolyte additives and use of electrode surface treatments or artificial SEI. The multiscale modelling will simulate the interfacial resistance and the strategy to overcome this. Cathode materials will be optimized through doping from the perspective of electrolyte compatibility.
7	Cell mass production hampered due to difficulty in LiM handling (likelihood - low, severity - medium)	WP4	Increase slightly the thickness of the Li anode.
8	Lack of time to evaluate the 10 Ah Pouch Cell (likelihood - low, severity - medium)	WP5, WP6	Modelling projection combined with the existing experimental data will be performed to estimate life.
9	Some input parameters for multiscale model are difficult to obtain (likelihood - high, severity - low)	WP6	The new characterization routes developed ad-hoc for the project materials will help addressing these points. However, new experiments will be defined to complement the obtained information if required, including the generation proposals for accessing synchrotron facilities.
10	The final ADVAGEN cells (small and large) cannot fulfil the defined requirements (likelihood - medium, severity - low)	WP2, WP3, WP4, WP5	Production steps will be initiated as early as possible and great attention will be given in phasewise development.
11	Limited availability of battery material for recycling experiments	WP7	Experimental process optimization will be performed with simulated material provided by

	(likelihood - low, severity - medium)		the project partners to reduce the material requirement.
12	Unforeseen events that inhibit or prohibit/delay project execution (e.g. COVID-19 pandemic) (likelihood - medium, severity - medium)	All	Risk contingency plan part of management handbook; Flexibility of project management to allow adjustments of the project plan (corrective actions e.g., postponements, virtual instead of physical formats, etc.); Continuous communication with the project advisory board and EU project officer

The list above will be continuously reviewed and updated. Risks, problems, and any difficulties affecting the project will be discussed during the GA periodic meetings, unless an unforeseen problem occurs. If the latter case, the person identifying the problem should inform the WPLB as soon as possible and trigger a contingency activity, in close collaboration with the European Commission.

8. Conclusion

The ADVAGEN deliverable 1.1 outlines the rules and procedures that the ADVAGEN consortium members need to follow for a successful and high-quality completion of the project. It acts as a single point of reference for all participants on the procedure. The management structure and all boards and bodies are defined and described based on the agreement between all partners and in line with the Consortium Agreement.