
# High voltage, room temperature single-ion polymer electrolyte for safer all solid state lithium metal batteries

## D7.1 - “Project Method and Activity Plan”

Work Package 7 – Project Coordination and Management

Task 7.1 – Coordination: Internal communication and contractual, administrative and financial project management

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| | |
|---|---|
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# INFORMATION

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# DISSEMINATION LEVEL

| | | |
|---|---|---|
| CO | Confidential | |
| CL | Classified | |
| PU | Public | x |

# VERSIONS

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# DISCLAIMER

# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ABF | Le Groupe ARMOR |
| ACCU | Accurec Recycling GmbH |
| BS | Blue Solutions SA |
| CA | Consortium Agreement |
| C&D | Communication and Dissemination |
| CFS | Certificates on the Financial Statements |
| CL | CLERENS |
| CNRS | Centre National de la Recherche Scientifique |
| CSPE | PEO- and or PC-based single-ion conductive polymer |
| DoA | Description of the Action |
| EB | Executive Board |
| EC | European Commission |
| GA | General Assembly |
| IPR | Intellectual Property Rights |
| LCA | Life Cycle Analysis |
| NIC | Kemijski Inštitut |
| NCM | Nickel Manganese Cobalt |
| PEO | Polyethylene oxide |
| PMP | Project Management Plan |
| POLITO | Politecnico di Torino |
| R-2-R | Roll-to-Roll |
| REN | RENAULT SAS |
| SOC | State of Charge |
| SG | Stakeholder Group |
| SP | Specific Polymers |
| SSPE | PEO-based electrolytes |
| UNINA | Universita degli Studi di Napoli Federico II |
| UU | Uppsala Universitet |
| WP | Work Package |
| WWU | Westfälische Wilhelms-Universität Muenster |

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# 1 Project Management Plan

## 1.1 Introduction

The PSIONIC project advances the development of all-solid-state battery technology by employing amorphous cross-linked Polyethylene oxide (PEO) laminated on the thin lithium foil at the anode and high voltage cathode coated with a single-ion conductive polymer. This will allow to replace the flammable and unstable liquid electrolytes and enabling dendrite-free cycling of high-energy lithium metal cells manufactured by sustainable processing. The research and innovation actions carried under the PSIONIC project will not only just contribute to the technological advancements of all-solid-state Li-ion batteries in terms of safety, reliability, performance, cost, and sustainability, but will also enable higher uptake by the electromobility sector and end consumers, paving a pathway towards climate neutrality, and green energy transition.

The purpose of the PSIONIC Project Management Plan (PMP) is to delineate the most relevant managerial aspects of the project and to set rules and responsibilities of the relevant parties. The project management plan is based on the Annex I to the Grant Agreement, the “Description of the Action (DoA)”, and further agreements proposed by the management team and discussed during the Kick-off Meeting. It is meant as guideline for the PSIONIC project. It is meant to be clear, sharp, comprehensive and easily accessible.

This document defines the operating procedure summarizing all the required knowledge for the good management of PSIONIC in terms of administrative forms, financial aspects, quality assurance process and other relevant elements.

## 1.2 Work Plan and WP Structure

The PSIONIC project is implemented in seven (7) Work Packages (WPs) consisting of five (5) technical WPs, one (1) WP for dissemination, communication and exploitation, and one (1) project coordination and management WP.

The structure and details of the WPs are as follows:

**WP1 – System definition and benchmarking** mainly focuses on the specification of cells’ components and cell/module design, definition of characterization methodology, benchmarking of new literature reports and periodical evaluation of testing results and advise on further cell development.

**WP2 – Polymer-based electrolyte synthesis and scale-up** focuses on the polymer-based electrolytes compatible with NMC cathode material and with metallic lithium anode, their characterization, and scale-up methodology.

**WP3 – Formulation of electrodes and interfaces** relates to the formulation of electrode compositions and interfaces. The main focus is on the cathode, modification of current collectors and extensive analytical work on interfaces.

**WP4 – Prototype cells and modules** Designed polymers from WP2 and an optimized cathode composite formulation, lithium metal processing, and thickness elaborated within WP3 will be employed in this WP.

WP4 deals with manufacturing of different sizes of prototype cells. Finally, large cells will be used for modules with integrated BMS designed for the selected chemistry.

**WP5 – Recycling, safety test and LCA** connected with the sustainable use of materials resources and with the circular economy. WP5 focuses on the possibility of using cells for the second life and to recycling process by designing less energy recycling. Cradle to cradle Life Cycle Assessment (LCA) will be done for both sets of prototypes.

**WP6 – Dissemination, Communication and Exploitation** aims to establish an appropriate and effective communication of the project to relevant stakeholders, the stationary battery community in general and to pave the way to exploitation of the PSIONIC project results.

**WP7 – Project Coordination and Management** focuses on the effective execution of the PSIONIC contract, the maintenance of the consortium agreement, the protection of IPR, management of Data and Ethics, the administrative and technical coordination.

As outlined in **Figure 1 – Work Package Structure: PERT Chart**, five (5) groups of activities are defined throughout the project life cycle in order to achieve the main objective of safe and reliable solid-state batteries.

1. **Requirements** focuses on the work done within WP1 including the specification of the components, their quantities and workflow of materials preparation and conditions for cells characterization.
2. **Design** involves work across WP2, aiming to prepare solid-state polymer electrolyte materials at anode and cathode sides, and WP3 focusing on formulation of electrodes and interfaces.
3. **Validation** of selected cells and upscale of solid electrolytes is done in WP4.
4. **End of use assessment** will be performed in WP5.
5. **Communication, dissemination, and exploitation including coordination and management** will be performed in WP6 and in WP7 respectively throughout the project.

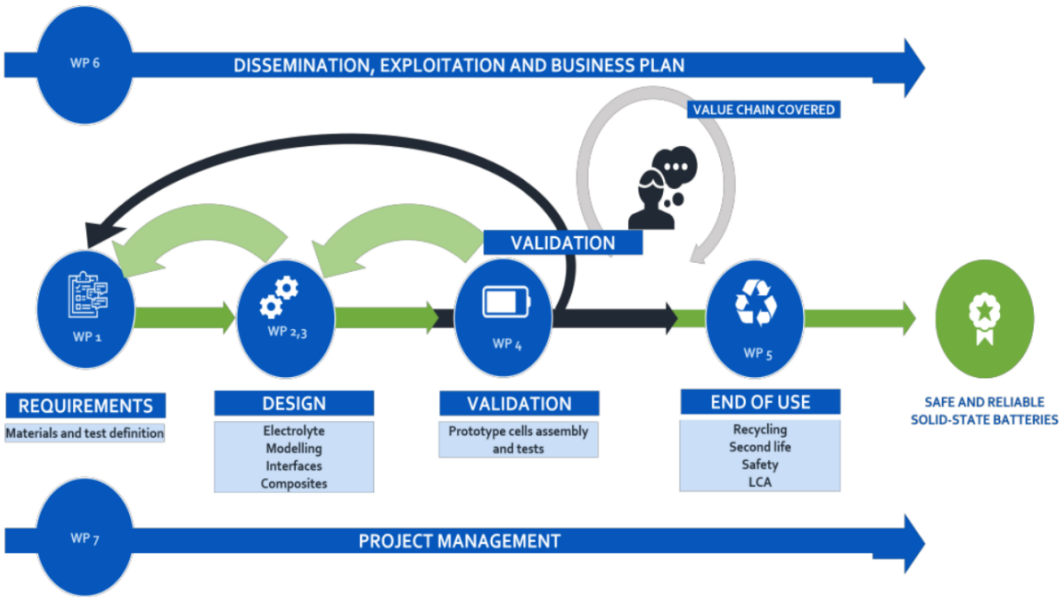


*Figure 1 – Work Package Structure: PERT Chart*

The detailed Gantt Chart including the timing of each task, deliverable and milestone is provided in **Figure 2** below.

| | Month | | Year 1 | | | | Year 2 | | | | Year 3 | | | | Year 4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Start | End | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **WP1 - System definition and benchmarking** | 1 | 48 | | | | | | | | | | | | | | | | |
| T1.1 Specification of cells components and cell/module design | 1 | 20 | | D1.1 | | | | | | | | | | | | | | |
| T1.2 Definition of characterisation methodology | 3 | 9 | | | D1.2 | | | | | | | | | | | | | |
| T1.3 Benchmarking of new literature reports | 1 | 36 | | | | | | | | | | | | D1.3 | | | | |
| T1.4 Periodical evaluation of testing results and advise on further cell development | 12 | 48 | | | | | | | | | | | | | | | | D1.4 |
| **WP2 - Polymer-based electrolyte synthesis and scale up** | 1 | 42 | | | | | Ms2.1 | | | | | | Ms2.2<br>Ms2.3 | | | | | |
| T2.1 Polymers for GEN 1 all-solid-state cell | 1 | 20 | | | | | | | D2.1 | | | | | | | | | |
| T2.2 Polymers for GEN 2 all-solid-state cell | 16 | 36 | | | | | | | | | | | | D2.2 | | | | |
| T2.3 Modelling of polymer properties and interfacial resistance supported by advanced characterization | 1 | 36 | | | | | | | | | | | | D2.3 | | | | |
| T2.4 Scale up | 31 | 42 | | | | | | | | | | | | | | D2.4 | | |
| **WP3 - Formulation of electrodes and interfaces** | 1 | 42 | | | | Ms3.1 | Ms3.2 | Ms3.3 | | | | Ms3.4<br>Ms3.5 | | | | | | |
| T3.1 Cathode composite formulation and interface engineering | 1 | 36 | | | | | | | | | | | | | | | | |
| T3.2 Lithium metal anode engineering | 1 | 36 | | | | | | | | | | | | | | | | |
| T3.3 Current collector modification | 7 | 36 | | | | | | | | | | | D3.3 | D3.5 | | | | |
| T3.4 Anode less Current Collectors | 1 | 42 | | | | D3.1 | | | | | | | | D3.4 | | D3.6 | | |
| T3.5 Characterisation of composite electrodes | 1 | 42 | | | | | D3.2 | | | | | | | | | | | |
| **WP4 - Prototype cells and modules** | 6 | 48 | | | | | | Ms4.1<br>Ms4.2 | | | | Ms4.3 | | Ms4.4 | | | | |
| T4.1 Cathode composites extrusion | 4 | 36 | | | | | D4.1 | | | | | | | | | | | |
| T4.2 Negative electrode for prototype cells | 9 | 42 | | | | | | | | | | D4.2 | | | | | | |
| T4.3 Lab-scale cells evaluation | 9 | 42 | | | | | | | | | | D4.3 | | | | | | |
| T4.4 Prototype cells cycling | 9 | 48 | | | | | | | | | | | | D4.4 | | | | |
| T4.5 Modules and BMS | 37 | 48 | | | | | | | | | | | | | | | | D4.5 |
| **WP5 - Recycling, safety test and LCA** | 1 | 48 | | | | | | | | | | | | | | Ms5.1 | | Ms5.2 |
| T5.1 Safety tests | 19 | 42 | | | | | | | | | | | | | | D5.1 | | |
| T5.2 Post mortem analysis | 13 | 48 | | | | | | | | | | | | | | D5.2 | | |
| T5.3 Second life of all-solid-state batteries | 25 | 48 | | | | | | | | | | | | | | | | D5.3 |
| T5.4 PSIONIC battery recycling | 7 | 48 | | | | | | | | | | | | | | | | D5.4 |
| T5.5 Life cycle assessment | 7 | 48 | | | | | | | | | | | | | | | | D5.5 |
| **WP6 - Dissemination, Exploitation and Business Plan** | 1 | 48 | | | | | | | | | | | | | | | | |
| T6.1 Dissemination and Communication Actions | 1 | 48 | | D6.1, D6.2 | | | | | | D6.4 | | | | | | | | D6.6 D6.7 |
| T6.2 Exploitation Streategy and Plan | 13 | 48 | | | | | | D6.3 | | | | | | | | D6.5 | | |
| **WP7 - Project Mangement** | 1 | 48 | | | | | | | | | | | | | | | | |
| T7.1 Coordination: Internal communication and contractual, administrative and financial project management | 1 | 48 | | D7.1 | | | | | | | | | | | | | | |
| T7.2 Technical coordination and quality assurance | 1 | 48 | | | | D7.3 | | | | | | | | | | | | D7.4 |
| T7.3 Research knowledge and data management mechanism | 1 | 48 | | D7.2 | | | | | | | | | | | | | | |
| T7.4 Ethics assessment and management | 1 | 48 | | | | | | | | | | | | | | | | D7.5 |

*Figure 2 – GANTT Chart*

## 1.3 Management Structure and Consortium Bodies

The management structure and the different consortium bodies are shown in **Figure 3** below.

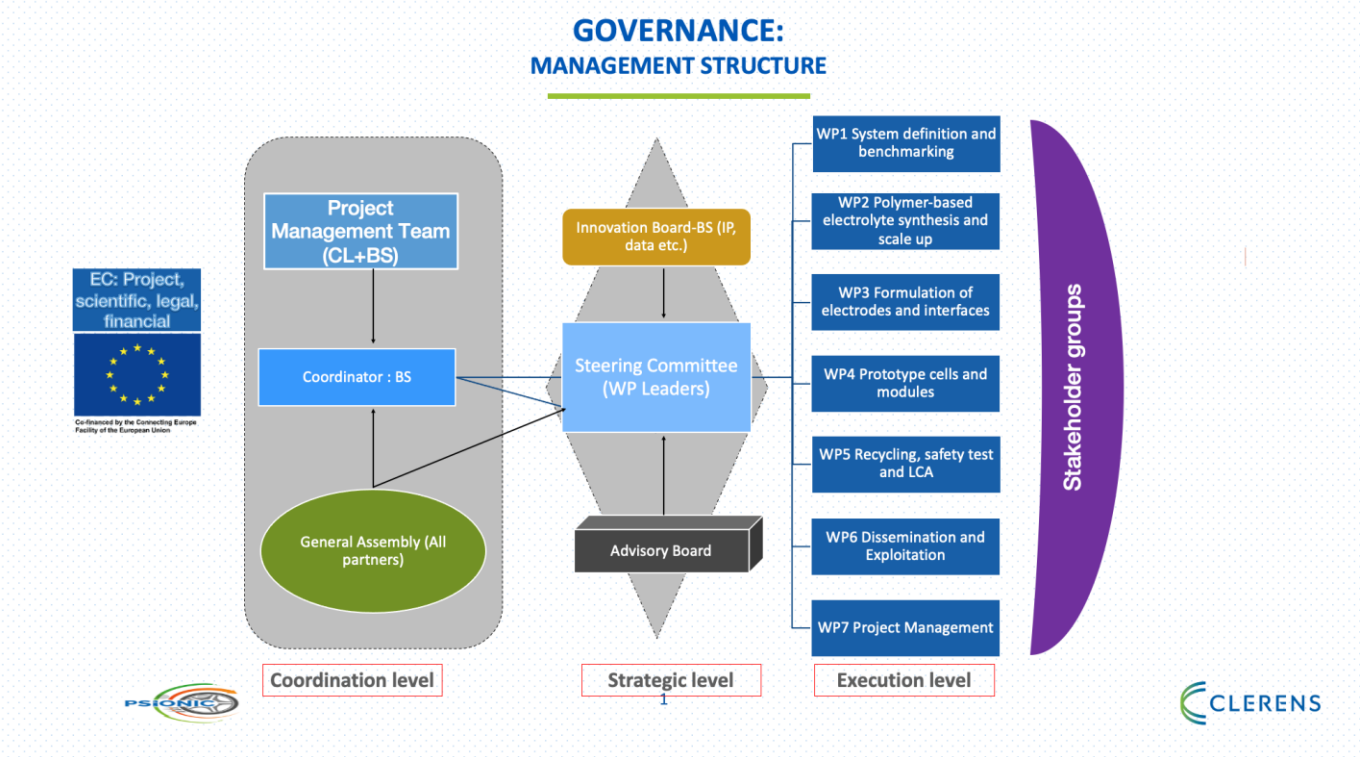


*Figure 3 – Management Structure of PSIONIC*

### *1.3.1 Project Management Team*

Project Coordinator

The project coordinator's most important task is to ensure *completion of the work in time, within budget, and to a high quality*. The coordinator is the *primus inter pares* and as such responsible for the overall project management, including coordination of the scientific and technical work plan, innovation management and preparative exploitation activities. All partners have their responsibility to perform the tasks, they are assigned to, *in time, within budget, and to a high quality*.

The designated Coordinator of PSIONIC project is Ms. Margaud LECUYER (BS). She has been graduated from a french engineering school (ESPCI Paris Tech) and then had a PhD on Lithium-Sulfur and Lithium-organic batteries from Nantes University. She has 12 years experience in solid state Lithium metal batteries, having explored positions in research and development from relationships with quality insurance, production, process, customers and suppliers to innovation management. Today, she is in charge of a research team focused on the development of GEN4 cells.

The following tasks will be carried out by the Project Coordinator:

- Overall technical coordination of the scientific and technical work plan;
- Maintaining contact with the EC (project, legal and financial officers);

- Notifying the Project Officer of developments that may require amendments of the Grant Agreement;
- Providing overviews of the work progress to the EC (Project Officer);
- Final review and approval of deliverables submitted to the EC and material to be disseminated (together with the leader of the Dissemination, Communication and Exploitation work package);
- Chairing General Assembly and Steering Committee meetings;
- Preparing and attending scheduled review meetings with the Project Officer;
- Managing the risks and contingency plans with the support of project management support team and Innovation Manager.

Project Management Team

The project management support team for managerial and administrative duties (represented by CL) will support the consortium, Project Coordinator, General Assembly, Executive Board, Advisory Board and Steering Committee with managerial, organizational and secretarial duties, administration and archiving work, such as:

- Support the consortium and Project Coordinator in the daily management of the project;
- Act as contact point for all partners and maintaining a high level of communication within the consortium;
- Organizing and documenting project meetings, like General Assembly and Steering Committee, including distributing documents before and after meetings;
- Support the Project Coordinator in managing deliverables and administrative documents, e.g. financial plans, (progress) reports etc.;
- Support the consortium and Project Coordinator in producing and updating overviews of consortium expenses and deviations and keeping track of financial transactions between the EC and the consortium;
- Provide support in coordinating the preparation of the periodic management reports and the final report;
- Collect, check and send to the EC the required cost statements, based on the scheduled plan using the systems as provided by the EC.

### *1.3.2 Executive Board (EB) and WP / Task Leaders*

The EB is the highest operational body within the consortium. The EB comprises the Project Coordinator and the work package leaders.

The following tasks will be carried out by the EB:

- Monitoring and control of the technical progress in the work packages, project schedule and deliverables;
- Assuring cooperation and integration between the work packages;
- Providing methodological and technical assistance to all work packages and tasks;
- Regular risk analysis and preparation of contingency plans, if required;
- Conducting periodic progress meetings on a bi-monthly basis via teleconferences;

- Prepare changes which need decisions to be taken in the General Assembly.

The names of the appointed WP leaders and their deputies have been presented at the Kick-off Meeting and approved. The overview is reported in the table below.

| WP Leaders & Deputies | | | |
|---|---|---|---|
| **Roles** | **Name of Leader** | **Name of Deputy** | **Organization** |
| WP1 Leader | Margaud LECUYER | Alia JOUHARA | BS |
| WP2 Leader | Samuel MALBURET | Alain GRAILLOT | SP |
| WP3 Leader | Robert DOMINKO | Urban KOŠIR | NIC |
| WP4 Leader | Margaud LECUYER | Alia JOUHARA | BS |
| WP5 Leader | Zhangqi WANG | N/A | ACCU |
| WP6 Leader | Mashood NASIR | Lucia SARDONE | CL |
| WP7 Leader | Margaud LECUYER | Alia JOUHARA | BS |

*Table 1 – Overview of the appointed WP leaders and their deputies*

The work package leaders will coordinate and chair their own work package meetings. Work package leaders deal with the technical developments, overall coherence, and technical implementation of the project output.

Each work package leader has the following tasks:

- Maintaining monthly contact with the task leaders and coordination of the activities in the work package;
- Ensuring completion of work package activities and deliverables on time, within budget and of high quality;
- (In)formal reporting on work package progress, quality and risk status to the coordinator and EB.
- Reviewing and approval of all formal work package deliverables;
- Managing of risks within the work package.

For **task leaders** a similar set of tasks as for work package leaders is valid, be it on a task level.

### *1.3.3 General Assembly (GA)*

The General Assembly (GA) is the high-level steering body of the project in terms of scientific goals, overall progress, finance, quality, dissemination and exploitation. The Project Coordinator chairs the GA and GA consists of one main representative or a deputy representative from each partner with the mandate to vote on high level project decisions. The chairperson shall convene ordinary meetings of the GA at least once every six (6) months and shall also convene additional meetings if needed (and possibly by phone conference). 2/3 majority of votes (7 out of 12) is required for deciding validly in meetings.

| General Assembly Members |
|---|

| Partner | Name-Surname | E-mail Address |
|---|---|---|
| Blue Solutions SA (BS) | Margaud LECUYER | margaud.lecuyer@blue-solutions.fr |
| Accurec Recycling GmbH (ACCU) | Zhangqi WANG | zq.wang@accurec.de |
| Le Groupe ARMOR (ABF) | Antoine MAUFROY | antoine.maufroy@armor-group.com |
| Centre National de la Recherche Scientifique (CNRS) | Matthieu BECUWE | matthieu.becuwe@u-picardie.fr |
| Kemijski Inštitut (NIC) | Robert DOMINKO | Robert.Dominko@ki.si |
| Politecnico di Torino (POLITO) | Claudio GERBALDI | claudio.gerbaldi@polito.it |
| Westfälische Wilhelms-Universität Muenster (WWU) | Adrienne HAMMERSCHMIDT | adrienne.hammerschmidt@uni-muenster.de |
| Specific Polymers (SP) | Samuel MALBURET | samuel.malburet@specificpolymers.fr |
| Uppsala Universitet (UU) | Daniel BRANDELL | daniel.brandell@kemi.uu.se |
| RENAULT SAS (REN) | Victor CHAUDOY | victor.chaudoy@renault.com |
| I.C. BELGIUM SCRL (CLERENS) | Mashood NASIR | m.nasir@clerens.eu |
| Universita degli Studi di Napoli Federico II (UNINA) | Michele PAVONE | michele.pavone@unina.it |

*Table 2 – Main contact persons of GA members*

### *1.3.4 Innovation Management*

Innovation management is a process, which requires an understanding of both the market and the technical possibilities, with an aim to successfully implement appropriate creative ideas. With good innovation management it should allow a consortium to respond quickly and thoroughly to both internal and external opportunities.

The Innovation Manager of PSIONIC project is Mr. Olivier COLAS (**BS**). The Innovation Manager will:

- Monitor and follow up the technological developments during the project;
- Play a key role in developing the exploitation strategy.

### *1.3.5 Budget / Cost Management*

The objective of cost management is to ensure that Project is completed within Budget. It refers to tracking gathering and managing financial resources. Each partner is responsible to control their own costs in according with the own accounting principles. For each reporting period figures are passed to the Project Coordinator and support team by the partners.

With respect to payment procedure/financial statements, the rules defined in the Consortium Agreement (CA) and Grant Agreement will be followed.

### *1.3.6 Issue Management*

Conflicts are not expected to happen since role of each partner has been established in PSIONIC. In the event of conflicts, resolution is based in the principle that disputes are resolved by consent.

In case conflicts arise between the consortium dealing with the project or other matters, the following steps are taken:

- Partners will try to solve among themselves;
- In case it cannot be solved, it will be raised to PC trying to find a solution;

- If all above attempts fail, it will be raised to GA or if needed an extra meeting of GA will be considered. The GA will decide the procedure to solve the problem.

More on conflict resolution is agreed among the partners in the CA.

### *1.3.7 Stakeholder Group (SG)*

The PSIONIC target groups consist of various types of stakeholders with different backgrounds and interests in the project from the scientific community, end users, financial actors, and public, and will differ depending on their scope at local, regional, national, European or international level.

| Stakeholder groups | Types of organizations/individuals | Goal |
|---|---|---|
| Battery industry, technology providers | • Energy distributors and producers,<br>• Battery manufacturers,<br>• Automotive sector,<br>• Storage system developers | • Recommendations for improvements of the PSIONIC technology;<br>• Mobilization of the sector's interest; Improved cooperation |
| Policy makers and public bodies | • EU Institutions,<br>• National governments,<br>• Regional/local authorities | • Provide innovative solutions for the whole battery value chain;<br>• Influencing new regulation and policy for batteries at EU and national level;<br>• Contributing to the future of a sustainable EU; |
| Research and scientific community; Battery Community | • Universities and research institutions,<br>• Research associations/networks,<br>• Battery platforms/projects | • Mutual learning; Enhancement of R&D;<br>• Knowledge spill-over;<br>• Dissemination of results |
| Media and journalists | Relevant media networks and projects | Informing civil society and citizens about the results, new sustainable technologies and their role in energy storage. |
| General public | • EV consumers,<br>• Citizens,<br>• NGOs,<br>• Associations,<br>• Civil society | |

*Table 3 – Target Groups*

## 1.4 Management Procedures and Progress Monitoring

The organizational structure, composed of a Project Coordinator (**BS**) assisted by the project management support team (**CL**), an EB for a regular assessment of the progress and a GA as the ultimate decision body in the project, has proven its appropriateness and adequacy in numerous EU funded projects. The management method and procedures applied by partner CL for planning, monitoring and control of the progress of the research are derived from the methods and procedures used by multinationals for managing large research and development programmes.

### *1.4.1 Communication within the Consortium*

E-mail correspondence is the principal mean of communication between partners. The mail distribution list is regularly maintained and updated indicating administrative and technical contacts. Conference calls can be used by partners without spending time for travelling. Conferences should be planned at least one (1)

week in advance (an agenda should be sent beforehand) and PC and project support team will be informed about the conference.

All information circulated will be treated as consortium confidential unless stated otherwise.

### *1.4.2 Internal Project Monitoring*

| **Reporting** | | | | | **Payments** | |
|---|---|---|---|---|---|---|
| Reporting periods | | | **Type** | **Deadline** | **Type** | **Deadline (time to pay)** |
| **RP No** | **Month from** | **Month to** | | | | |
| | | | | | Initial prefinancing | 30 days from entry into force/10 days before starting date – whichever is the latest |
| 1 | 1 | 18 | Periodic report | 60 days after end of reporting period | Interim payment | 90 days from receiving periodic report |
| 2 | 19 | 36 | Periodic report | 60 days after end of reporting period | Interim payment | 90 days from receiving periodic report |
| 3 | 37 | 48 | Periodic report | 60 days after end of reporting period | Final payment | 90 days from receiving periodic report |

*Table 4 – Reporting and payment schedule*

In order to deliver on time periodic reporting (including technical and financial parts) for timely payments (interim and final) (see Table 4), at the end of each 6 months period, management summaries will be requested from all partners for internal project monitoring on the progress of the action (e.g. **deliverables, milestones, outputs/outcomes, critical risks, indicators,** etc.; if any). The idea is to set up and maintain an 'early-warning' system (for possible technical and financial risks) via clear, simple and transparent procedures. In particular:

**Technical Report:** a simple Word template will be provided by CL. Each partner will have to report on the activities undertaken during the specific period, including:

- possible deviation from the DoA,
- participation at meetings,
- contribution to milestones/deliverables,
- risks/problems encountered, or which may arise in short future,
- attention points.

**Financial Report** will include:

- the financial statements (individual and consolidated; for all partners),
- the explanation on the use of resources (or detailed cost reporting table, if required),
- the certificates on the financial statements (CFS) (if required).

## 1.5 Change Management

In a collaborative project, involving 13 partners (from 6 different European countries), 4 years planning and a significant budget, changes may happen. In order not to have any unexpected issues at the end of an official period (or of the project), the project management team and the entire consortium is committed to maintain an open and transparent communication system. Nevertheless, the 'Rules of the Game' are clearly reported below.

### *1.5.1 Changes in Budget*

Each partner is requested to:

- Report immediately, as soon as the possibility of a budget modification is considered, to the coordinator,
- Provide the financial report every 6 months and clearly report on the expenditures and financial planning.

The coordinator together with the project management team will evaluate the situation, propose scenarios and possible solutions and inform accordingly the project officer for further discussion and alignment.

Below a list of the most common situations which may raise:

- Budget shift at partner level (only one partner involved, the total costs are not changing): some budget needs to be shifted from one WP to another or from one category to another (ex. From travel to 'other direct costs') à in principle no amendment to the Grant Agreement will be necessary but this should be discussed with the Project Officer and the Commission. Anyway, convincing justification for this shift should be provided.
- Budget shift between different partners may request an amendment of the Grant Agreement and it should be carefully analyzed by the EB and – finally – by the Commission. Supporting documents need to be provided.

### *1.5.2 Changes in Personnel*

A project contact list is available and updated regularly by CL with inputs from all partners. However, changes in personnel/PhD students/collaborators joining or leaving the project team need to be communicated immediately to the management team (this project is dealing with confidential information and in case someone leaves the team it is important to remove his/her access to the project document database).

- Changes at GA/EB level need to be presented and discussed during these meetings.
- In case of change of the coordinator an amendment to the Grant Agreement will be necessary.
- Partners are requested to report changes immediately to the management team.

### *1.5.3 Changes in Technical Content and Timing*

Each change related to the technical content and timing needs to be reported to the Project Officer (via the Project Coordinator).

Minor re-planning and re-alignment of the activities may be implemented, but in case of changes in the scope/objectives of a specific WP an amendment to the Grant Agreement will be necessary.

Partners are requested to report possible changes to a specific task to the WP leader immediately who will evaluate the situation and inform the management team.

## 1.6 Communication, Confidentiality and IP Ownership

Internal communication will be stimulated as much as possible by the management team and the Executive Board members. Frequent teleconferences and meetings will be organized among partners.

The partners have concluded a Consortium Agreement, in which all relevant issues necessary for the proper execution of the project are described in detail.

Below a summary of a few articles related to decisions, communication and confidentiality.

### *1.6.1 Decision and Voting Rules*

***Article 6.3.4.1 of the CA***

The General Assembly shall not deliberate and decide validly in meetings unless two-thirds (2/3) of its Members are present or represented (quorum). If the quorum is not reached, the chairperson of the General Assembly shall convene another ordinary meeting within fifteen (15) calendar days. If in this meeting the quorum is not reached once more, the chairperson shall convene an extraordinary meeting which shall be entitled to decide even if less than the quorum of Members is present or represented.

***Article 6.3.4.2 of the CA***

Each Member present or represented in the meeting shall have one (1) vote.

### *1.6.2 Intellectual Property Rights (IPR)*

The beneficiaries must give each other and the other participants access to the "background" identified as needed for implementing the action, subject to any specific rules in Annex 5 of the Grant Agreement. "Background" means any data, know-how or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that is:

a) held by the beneficiaries before they acceded to the Agreement and
b) needed to implement the action or exploit the results.

***Article 8.1 of the CA*** states that the "results" are owned by the Party that generates them. "Results" means any tangible or intangible effect of the action, such as data, know-how or information, whatever its form or nature, whether or not it can be protected, as well as any rights attached to it, including intellectual property rights.

Joint ownership is governed by the Grant Agreement with the following additions:

Unless otherwise agreed:

- each of the joint owners shall be entitled to use their jointly owned Results for non- commercial research and teaching activities on a royalty-free basis, and without requiring the prior consent of the other joint owner(s).
- each of the joint owners shall be entitled to otherwise Exploit the jointly owned Results and to grant non-exclusive licenses to third parties (without any right to sub-license) if the other joint owners are given: (a) at least 45 calendar days advance notice; and (b) fair and reasonable compensation.

The joint owners shall agree on all protection measures and the division of related cost in advance.

### *1.6.3 Transfer of Results*

***Article 8.3 of the CA***

Each Party may transfer ownership of its own Results, including its share in jointly owned Results, following the procedures of the Grant Agreement Article 16.4 and its Annex 5, Section Transfer and licensing of results, sub-section “Transfer of ownership”.

### *1.6.4 Dissemination of Results*

***Article 8.4.2.1 of the CA***

During the Project and for a period of one (1) year after the end of the Project, the dissemination of own Results by one or several Parties including but not restricted to publications and presentations, shall be governed by the procedure of Article 17.4 of the Grant Agreement and its Annex 5, Section Dissemination, subject to the following provisions.

Prior notice of any planned publication shall be given to the other Parties at least forty-five (45) calendar days before the publication. Any objection to the planned publication shall be made in accordance with the Grant Agreement by written notice to the Coordinator and to the Party or Parties proposing the dissemination within thirty (30) calendar days after receipt of the notice. If no objection is made within the time limit stated above, the publication is permitted.

### *1.6.5 Acknowledgment of EU Funding*

***Article 17.2 of the GA***

Unless otherwise agreed with the granting authority, communication activities of the beneficiaries related to the action (including media relations, conferences, seminars, information material, such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.), 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):

Funded by the
European Union

Co-funded by the
European Union


*Figure 4 – Usage of EU flag (emblem)*

Any communication or dissemination activity related to the action must indicate the following disclaimer (translated into local languages where appropriate):

> *"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."*

### 1.6.6 Early Information of Planned Dissemination

Please note:

- Dissemination activities must be planned well in advance to allow for proper quality review and security assessment;
- All partners need to be informed well in advance (45 days prior) to formal publications such as journals, presentations at conferences, contributions to proceedings, and alike.

# 2 Quality Assurance

## 2.1 Review Process for Project Deliverables and Reports

The term “Deliverables” refers to the formal PSIONIC Project deliverables as described in the Grant Agreement No. 101069703; the term “Reports” refers not only to the compulsory reports for the Commission but – more in general – also to other publications and exposures of PSIONIC activities to third parties.

Also content on the project website can be considered a report; with the notion that all information presented at the website has to be public, the website host is responsible for quality and sanity checks on information that is to be published on the PSIONIC website.

For confidential deliverable(s) a short publishable summary can be offered on the website.

The following section concerns formal PSIONIC deliverables and scientific publications and presentations concerning PSIONIC developments.

An overview of all other PSIONIC exhibitions and presentations will be included in the PSIONIC Dissemination Plan. This plan will be regularly updated with initiatives from the consortium and/or individual partners that intend to deliver PSIONIC related publications, presentations and these types of updates in the plan will be discussed and agreed upon at PSIONIC General Assembly and Executive Board meetings.

All deliverables have to undergo a quality assessment. The rules for quality assessment are laid out in next sections.

## 2.2 Quality Assurance Procedure

In order to ensure the quality of all PSIONIC deliverables, all deliverables will be reviewed internally before delivery to the Commission or to publishing bodies.

### *2.2.1 Quality Management Responsibilities*

The Innovation Manager Olivier COLAS (**BS**) together with the Project Coordinator Margaud LECUYER (**BS**) fulfill the role of overall Quality Manager. They supervise the overall assessment of project deliverables and are also responsible for timely delivery and uploading of project products to the EU portal and informing the Project Officer. This is especially important in case of delays in delivery dates of formal deliverables.

Each work package leader is quality manager for his/her own work package and for the deliverables developed within concerned work package. The WP Leader assigns internal reviewers to review a deliverable draft, preferably a staff member working in that work package who is not one of the deliverable authors (given the low staff number, this may not always be possible).

### *2.2.2 General Quality Management Procedure*

The quality management procedure recognizes the following timeline and steps to submit the deliverable in time:

| Submission Date | Action | Action by |
|---|---|---|

| | | |
|---|---|---|
| D-XX | Check on timely planning and prepare for supporting actions as necessary | WP Leader with Authors |
| D-28 | Assign Quality Reviewers and inform Coordinator (if applicable) | WP Leader |
| D-21 | Present final draft of deliverable for quality review to Reviewers | Main Author |
| D-14 | Provide review report with recommendations to Main Author and in copy to WP Leader | Quality Reviewers |
| D-10 | In case of serious modifications following from first review, revisit the review procedure in order to take appropriate measures as necessary | WPL, Authors and Reviewers |
| D-5 | Finalize deliverable and present to WP-leader | Main Author |
| D-3 | Present final version to project coordinator | WP Leader |
| D | Submit deliverable to the Commission | Project Coordinator |

*Table 5 – Time plan for quality management*

All deliverables are to show to have followed the effective quality management by indicating persons responsible for the quality review.

1. Due date (D) is the day at which deliverable has to be forwarded externally, be it the project officer or other bodies. Formal due dates for PSIONIC deliverables are the last day of the month specified in the PSIONIC deliverables table.
2. The author(s) of the deliverable shall use the latest deliverable template for creating the deliverable.
3. The WP Leader takes to the initiative to contact the EB members earlier if he/she fears that a part of the deliverable is critical.
4. The WP Leader responsible for a deliverable assigns reviewer(s) for the deliverable four (4) weeks before the deliverables' due date. The reviewer is independent from the authors and ideally is from at least one other PSIONIC consortium partner, ideally one of the WP participants. In case of a large or key deliverable, the WP Leader may assign multiple independent reviewers.
5. The internal review shall be completed no later than one (1) week after the review request.
6. The reviewer uses a standard review form (reported in Section 2.2.3 of this document) to document his/her review findings. The review form is maintained throughout this procedure until submission of the deliverable. It will remain stored in the PSIONIC project place for archive purposes.
7. The reviewer reviews the deliverable and sends his/her completed comments to the WP Leader and to the authors of the deliverable. The possible results of the review process are:
    a) **ACCEPT:** The deliverable is acceptable in its current form and the PSIONIC coordinator should submit it to the Commission.
    b) **ACCEPT w. REVISION:** The deliverable is in principle acceptable. However, some minor changes are needed. The author(s) should revise the deliverable. No further WP internal reviewing is required.
    c) **REVISE:** The deliverable is not acceptable in its current form. The author(s) proceed for improvement.
8. The author(s) revise the deliverable according to the review result within a maximum of five (5) days after receiving the request for quality improvement and inform the WP Leader which will request a new review preferably by the same reviewer.
9. The WP Leader checks the review and ensures that requested improvements are implemented by the author(s).
10. When the deliverable is accepted, the WP Leader informs the Project Management Team.

11. The Project Management Team checks the deliverable and the review form. He/She may issue a request for further improvement to the author(s) and the WP Leader. This procedure makes it highly likely that the twofold improved deliverable is ready for submission. If not, the author(s) must implement the final corrections as requested immediately.
12. Once the review and approved procedure is completed, the Project Coordinator then submits the deliverable to the Commission in electronic form (PDF). The Management Team stores the PDF of submitted deliverables.
13. The final version of the deliverable must be submitted to the Commission as close as possible to the due date. Therefore, reviewing and revising must be performed as early and as fast as possible in case multiple review-revise cycles are necessary.

### *2.2.3 Deliverable Reviewer List*

The table below shows the quality reviewers list.

| Del. No | Deliverable Name | WP No | Lead Beneficiary | Type | Dissemination Level | Due Date (month) | Appointed Reviewer |
|---|---|---|---|---|---|---|---|
| **D1.1** | Specification of cells components and cell/module design | WP1 | 1 - Blue Solutions | R — Document, report | SEN - Sensitive | 6 | NIC<br>POLITO |
| **D1.2** | Definition of characterization methodology | WP1 | 10 - RENAULT SAS | R — Document, report | SEN - Sensitive | 9 | NIC<br>*POLITO* |
| **D1.3** | Promising direction from the literature | WP1 | 6 - POLITO | R — Document, report | PU - Public | 36 | UNINA<br>SP |
| **D1.4** | Cell development and future directions | WP1 | 1 - Blue Solutions | R — Document, report | PU - Public | 48 | NIC<br>REN |
| **D2.1** | Library of GEN 1 materials | WP2 | 12 - UNINA | R — Document, report | SEN - Sensitive | 20 | CNRS<br>POLITO<br>SP |
| **D2.2** | Optimized GEN 2 materials including synthesis, methods target characteristics and development status | WP2 | 8 - SP | R — Document, report | SEN - Sensitive | 36 | BS<br>POLITO |
| **D2.3** | Full-cell solid-state model | WP2 | 9 - UU | R — Document, report | SEN - Sensitive | 36 | UNINA<br>SP |
| **D2.4** | Pre-industrial manufacturing of the selected GEN 2 | WP2 | 8 - SP | R — Document, report | SEN - Sensitive | 42 | CNRS<br>BS |
| **D3.1** | Definition of the cathode formulation for the first set of prototypes | WP3 | 4 - CNRS | R — Document, report | SEN - Sensitive | 12 | NIC<br>BS |
| **D3.2** | Lithium metal protection layer for the WP3 7 - WWU R — Document, report SEN - Sensitive 15 first set of prototypes | WP3 | 7 - WWU | R — Document, report | SEN - Sensitive | 15 | NIC<br>POLITO |
| **D3.3** | Lithium metal protection layer for the 2nd set of prototypes | WP3 | 7 - WWU | R — Document, report | SEN - Sensitive | 30 | NIC<br>BS |
| **D3.4** | Definition of the cathode formulation for the 2nd set of prototypes | WP3 | 4 - CNRS | R — Document, report | SEN - Sensitive | 36 | NIC<br>POLITO |
| **D3.5** | Report on development of current collector | WP3 | 3 - ABF | R — Document, report | SEN - Sensitive | 36 | NIC<br>CNRS |
| **D3.6** | Anode less concept | WP3 | 7 - WWU | R — Document, report | PU - Public | 42 | NIC<br>BS |
| **D4.1** | Electrochemical results from GEN 1 small prototype cells | WP4 | 4 - CNRS | R — Document, report | SEN - Sensitive | 15 | POLITO<br>SP |
| **D4.2** | Electrochemical results from GEN 1 cells | WP4 | 1 - Blue Solutions | R — Document, report | SEN - Sensitive | 30 | CNRS<br>NIC |
| **D4.3** | Electrochemical results from GEN 2 small prototype cells | WP4 | 4 - CNRS | R — Document, report | SEN - Sensitive | 30 | POLITO<br>SP |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **D4.4** | Electrochemical results from GEN 2 cells | WP4 | 1 - Blue Solutions | R — Document, report | SEN - Sensitive | 36 | SP<br>NIC |
| **D4.5** | Final BMS for polymer batteries module from consumers' perspective | WP4 | 1 - Blue Solutions | R — Document, report | PU - Public | 48 | REN<br>WWU |
| **D5.1** | Safety tests | WP5 | 1 - Blue Solutions | R — Document, report | SEN - Sensitive | 42 | ACCU<br>REN |
| **D5.2** | Report on post-mortem analysis | WP5 | 5 - NIC | R — Document, report | SEN - Sensitive | 42 | ACCU<br>BS |
| **D5.3** | Second life of all-solid-state polymer battery | WP5 | 4 - CNRS | R — Document, report | PU - Public | 48 | ACCU<br>REN |
| **D5.4** | Final report on recovery and recycling technology of PSIONIC battery | WP5 | 2 - AC | R — Document, report | PU - Public | 48 | ACCU<br>BS |
| **D5.5** | Life Cycle Assessment | WP5 | 10 - RENAULT SAS | R — Document, report | SEN - Sensitive | 48 | ACCU<br>BS |
| **D6.1** | Report on project identity and website | WP6 | 11 - CLERENS | R — Document, report | PU - Public | 4 | BS<br>ABF |
| **D6.2** | First Communication, Dissemination and Exploitation Plan | WP6 | 11 - CLERENS | R — Document, report | PU - Public | 6 | BS<br>SP |
| **D6.3** | Mid-term Exploitation Strategy, Plan and IPR report | WP6 | 1 - Blue Solutions | R — Document, report | SEN - Sensitive | 18 | CL<br>REN |
| **D6.4** | Mid-term Communication and Dissemination Plan | WP6 | 11 - CLERENS | R — Document, report | PU - Public | 24 | BS<br>REN |
| **D6.5** | Final Exploitation Roadmap including Business Plan and IPR report | WP6 | 1 - Blue Solutions | R — Document, report | SEN - Sensitive | 42 | CL<br>REN |
| **D6.6** | Final Dissemination Report | WP6 | 11 - CLERENS | R — Document, report | PU - Public | 48 | BS<br>NIC |
| **D6.7** | Collection of newsletters and dissemination activities | WP6 | 11 - CLERENS | R — Document, report | PU - Public | 48 | ABF<br>UU |
| **D7.1** | Project method and activity plan | WP7 | 11 - CLERENS | R — Document, report | PU - Public | 4 | BS<br>UU |
| **D7.2** | Data management plan prepared and maintained | WP7 | 1 - Blue Solutions | R — Document, report | PU - Public | 6 | NIC<br>ABF<br>CL |
| **D7.3** | First year risk management plan | WP7 | 1 - Blue Solutions | R — Document, report | PU - Public | 12 | POLITO<br>SP |
| **D7.4** | Final risk management report | WP7 | 1 - Blue Solutions | R — Document, report | PU - Public | 48 | CL<br>WWU |
| **D7.5** | Ethics assessment report | WP7 | 1 - Blue Solutions | R — Document, report | PU - Public | 48 | ABF<br>UU |

*Table 6 – Deliverable Reviewer List*

### 2.2.4 General Quality Criteria

This subsection gives an overview of the quality criteria that should be applied to ensure the quality of the deliverables.

Apart from reviewing the deliverables' content under a technical point of view, quality reviewers should also consider the overall coherence of the deliverable itself.

The table below shows some questions that should guide all reviewers in the Quality Assurance Procedure

| Question | Author & Task Leader | WP Leader | Peer Reviewer(s) | Technical Coordinator | Innovation Manager |
|---|---|---|---|---|---|
| | | | | Margaud LECUYER | Olivier COLAS |
| Do you accept this Deliverable as it is? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Are all required actions from the DoA performed and reported in the Deliverable? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Are all Interactive outputs clearly defined for the related Tasks? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is the Deliverable complete - omissions / all required chapters /- argumentation | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is the technical quality sufficient?<br>• inputs and assumptions correct<br>• data, calculations and motivations correct<br>• outputs and conclusions correct | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Are the tasks/WP/project objectives clearly addressed in the Deliverable? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is created and potential IP identified and are protection measures in place? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is the Risk Procedure followed and reported? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is the Reporting quality sufficient?<br>• clear language<br>• argumentation<br>• consistency<br>• structure<br>• use of templates, etc. | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is the Deliverable formatted according to the project template? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |
| Is the Deliverable ready? | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) | Yes/No (motivate) |

*Table 7 – Quality criteria overview*

### *2.2.5 Approval Process of Milestones*

WP leaders are responsible for the achievement of WP related milestones. WP leaders report to the Executive Board if they think a milestone has been achieved and the means of verification should be met. It will then be discussed, after which the management team can report to the Commission.

| Mil. No | Milestone Name | WP No | Lead Beneficiary | Means of Verification | Due Date (month) |
|---|---|---|---|---|---|
| 1 | Ms2.1 Selection of Polymers for GEN 1 | WP2 | 1 - Blue Solutions | Conventional PEO-based electrolyte stability (up to 4.3V) and working temperature (20-40°C) | 18 |
| 2 | Ms2.2 Selection of Polymers for GEN 2 | WP2 | 6 - POLITO | Extended anodic stability (up to ≥4.5V), transference number approaching unity and ionic conductivity ≥0.1 mS cm–1 at RT | 33 |
| 3 | Ms2.3 Scale up procedure defined for GEN 2 | WP2 | 8 - SP | Synthesis of 50-60 kg Polymer | 33 |
| 4 | Ms3.1 Areal capacity of electrodes 2-4 mAh/ cm2 for GEN 1 | WP3 | 5 - NIC | Practical capacity of cathode > 90 percent of the theoretical value | 12 |
| 5 | Ms3.2 Procedure definition for applying protection for Li metal anode for GEN 1 | WP3 | 1 - Blue Solutions | Lithium metal anode thickness 30 µm or less. | 15 |
| 6 | Ms3.3 Criteria defined for Al current collector stability | WP3 | 5 - NIC | Polymer coating on NCM particles with a thickness of 1 µm. | 18 |
| 7 | Ms3.4 Areal capacity of electrodes 2-4 mAh/ cm2 for GEN 2 | WP3 | 3 - ABF | Protection layer on Al current collector with a thickness of 1 µm. | 30 |
| 8 | Ms3.5 Procedure definition for applying protection for Li metal anode for GEN 2 | WP3 | 3 - ABF | Scale-up to develop current collectors on the reels format (from 100mm to 650mm wide, 100m to >5000 m long). | 30 |
| 9 | Ms4.1 Selected components for GEN 1 cells | WP4 | 1 - Blue Solutions | Energy density 420Wh/kg. | 18 |
| 10 | Ms4.2 50 cells with capacity 5Ah based on components selected for GEN 1 | WP4 | 1 - Blue Solutions | Cycling with current density up to 3C and 100% DoD at different temperatures. | 20 |
| 11 | Ms4.3 Selected components for GEN 2 cells | WP4 | 1 - Blue Solutions | Cycling with current density up to 3C and 100% DoD at different temperatures. | 30 |
| 12 | Ms4.4 50 cells with capacity 5Ah based on components selected for GEN 2 | WP4 | 1 - Blue Solutions | Six cells pack equipped with BMS. | 36 |
| 13 | Ms5.1 Collection of all needed data to successfully perform cradle-to-cradle LCA | WP5 | 10 - RENAULT SAS | Life Cycle Inventory (LCI) will be based on real primary data, delivered by the partners through dedicated templates (active materials, polymer electrolyte materials, cell assembly, etc.). | 42 |
| 14 | Ms5.2 Demonstrated recycling of lithium and other cell components | WP5 | 2 - AC | Demonstrated 60 wt.% efficiency of lithium recycling and 65 wt.% overall cell components recovery efficiency. | 48 |

*Table 8 – Project Milestones*

# 3 Risk Management Plan

As part of the overall management plan for the PSIONIC project, this document describes the risk management plan. It identifies conditions that may put the project at risk and provides guidance for managing these. It also provides methods and establishes roles and responsibilities of all participants in the risk management process.

## 3.1 Risk Analysis

The project risk management plan is an internal document for the PSIONIC consortium. It describes the project risks and the possible actions to be taken to prevent or mitigate delays and other disruptions in the execution of the project.

A preliminary risks analysis and proposed mitigation measures are presented in the Description of Action (detailed in Table 6). This section provides further details concerning the risk scale, the contingency plan and the partners' responsibilities. .

This Risk Management Plan describes the risk management approach to be followed within the PSIONIC project.

The approach is based on the steps which together form the “risk management cycle”:

- **Identify** In this step, risks are identified, with the moments at which they could occur and the specific symptoms of the risks.
- **Analyze** Here, the risk is analyzed further, looking also into the potential effects and consequences of the risk.
- **Plan** In this step, plans are developed for management of the specific risks, as well as contingency plans
- **Respond** The specific risk management plan is put into action. Actions are taken here to prevent the risk from happening full force, or to avoid undesired consequences of the risk.
- **Monitor** The actual status of the risks is monitored, using e.g. the risk symptoms as identified in the first step.

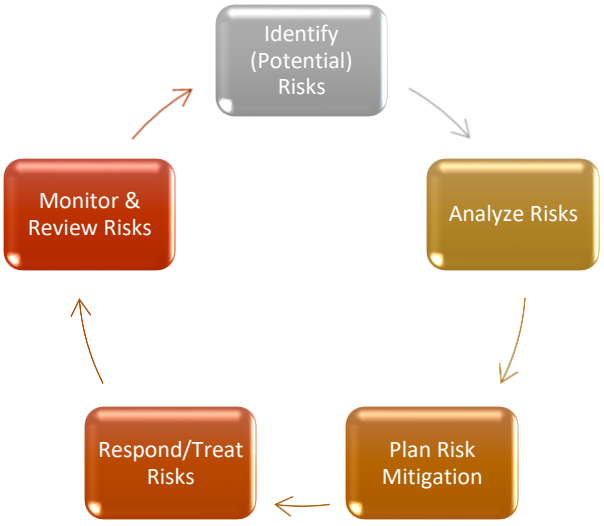


*Figure 5 – Risk Management Cycle*

These steps, including roles of partners, are described in this report. In risk management, the WP leaders and the Technical Coordinator will cooperate to be able to tackle imminent risks efficiently and timely.

The risk management circle formed by these five steps will continuously be performed during the implementation of the project.

## 3.2 Critical Risks and Risk Mitigation

In view of the highly innovative character of the proposed research, several risks are identified that may occur during the implementation of the PSIONIC project. The important risks are summarized in the table below. Impact and Scale (of the impact) are estimated on a three-point scale (Low, Medium, and High).

| Risk No | Description | Likelihood | Severity | WP No(s) | Proposed Mitigation Measures |
|---|---|---|---|---|---|
| 1 | A partner leaves the project | Low | Low | WP1 | The rest of the consortium will try to assume partner objectives, responsibilities, and resources or look for other partners with the same profile. |
| 2 | Project activities do not meet with originally planned ones | Low | Low | WP1 | WP Leader will ensure the working plan is correctly carried out. |
| 3 | Delays on deliverables results not meeting project objectives | Medium | Medium | WP1 | Regular meetings will be scheduled, work plan will be readjusted depending on the results got. |
| 4 | SSPE and CSPE with insufficient performances (e.g., conductivity, mechanical strength) | Low | High | WP2 | The existing solutions of SSPE and CSPE with good performances used as baseline (GEN 0-SSPE, CSPE). Increase polymer branching, use of additives to increase interface/conductivity, further optimize crosslinking, use of other single ion-conducting polymers or ceramics |
| 5 | CSPE and SSPE characteristics not adapted for extrusion process | Low | Medium | WP2 | Rheology measurements and extrusion attempts. Mitigation plan: modify the rheology and reactivity (for SSPE crosslinking) of materials by adapting their composition, reactive functions to ensure dry extrusion processing. If necessary, green solvents could be used |
| 6 | Inadequate predictive capability of material performances/ interface by modeling | Low | Medium | WP2 | Improved modeling approach, or selection of more appropriate modeling combined with characterization for parameters validation |
| 7 | SSPE and CSPE production are difficult to upscale | Medium | Medium | WP2 | Mitigation plan: efficient planning and follow-up. Experience on scale up production of the partners. Production of different generations of electrolytes and a large toolbox of SPE components. |
| 8 | Interfacial resistance between polymer and cathode material is too high | Medium | Medium | WP3 | Specific coating/functionalization of NCM particles to improve wettability with polymer electrolyte |
| 9 | Interfaces between cathode particles and electrolyte react | Low | Low | WP3 | Specific additives or functionalization of NCM particles to reduce irreversible reaction between electrolyte and active material |
| 10 | Time to develop current collector not suitable for the new materials | Medium | Low | WP3 | Anticipate any changes and tests as soon as possible the compatibility of the primer with new chemistries |
| 11 | Stability of lithium metal at high-rate charging | Medium | Medium | WP3 | Limitation of the charge rate and or SOC/decrease thickness |

| Risk No | Description | Likelihood | Severity | WP No(s) | Proposed Mitigation Measures |
|---|---|---|---|---|---|
| 12 | Lithium interfaces engineering activities provide too little input for scale up | Low | High | WP3 | Reconsider these approaches and use already proven methodologies (process with R-2-R capabilities) |
| 13 | Development of operando cell XPS measurements | Medium | High | WP3 | Focus on cell construction, tests in house, early discussion opportunities/developments at different large-scale facilities |
| 14 | Low degree of crosslinking in the bulk and directly on top of the electrodes | High | Medium | WP4 | Combined use of thermal initiators having high decomposition temperatures and low volatile glycidyl ether terminated oligomers that will polymerize with LiTFSI without any initiator (~100 °C) |
| 15 | Poor cathode materials adherence to the current collector | Low | Low | WP4 | The current collector will be tested as things progress in development of WP3 |
| 16 | Polymer degradation temperature too close to extrusion parameters | Medium | Low | WP4 | Use of green solvents as a processing aid |
| 17 | Interfacial resistance between components in prototype cells higher than in lab cell | Medium | Low | WP4 | Changing of the manufacturing process. |
| 18 | Processability and scale-up of lithium protection | Low | Low | WP5 | Taken into account during conception |
| 19 | Limited availability of materials for recycling processes | Low | Low | WP5 | Initial recycling evaluations will use production scrap and first prototype cells when it reaches end of life |
| 20 | Limited full-cells to perform aging testing | Low | Low | WP5 | Small scale coin cells can be used for ageing testing if larger pouch cells are not available |
| 21 | In case direct recycling methodology does not meet the target for battery application | High | Low | WP5 | ACC will still integrate those components in the recycling process which ensures all materials will be recycle bad. |
| 22 | Low outreach, ineffective communication/ dissemination | Low | Low | WP6 | Diffusion of advertisements on the social network. |

*Table 9 – Preliminary Risk Analysis and Proposed Mitigation Measures*

## 3.3 Role of Partners and Coordinator in Risk Management

The monitoring of these risks, and the reporting of new, as yet unidentified risks, will actually be a task of everyone involved in PSIONIC. In the end it is the responsibility of the Executive Board to assess the possible occurrence of the risks, and to decide on the mitigation measures or, eventually, a modification of the work plan.

During the execution of the PSIONIC project frequent Executive Board meetings will be held to monitor progress, stimulate interactions between respective work packages, seek for feedback and exchange lessons learned, and to respect timely delivery of intermediate results, project deliverables and milestones.

The prevention of problems, avoidance of deviations from the project work plan, and mitigation of any risks arising as well as enhancement of the project success is an important task of project management in general.

Access to and involvement of stakeholders in both public and private sectors is of high importance for the success of PSIONIC. Naturally, this broad network is available through the composition of the consortium itself. In addition, the PSIONIC Stakeholder Group, and its individual members, helps to get access to the stakeholder communities in Europe. The Stakeholder Group is an important instrument to ensure that the products and services developed by PSIONIC continue to match with the requirements of the stakeholders.

The management work plan will spell out roles and responsibilities for proper execution of the PSIONIC Project and will distinguish between:

- **Persons responsible for deliverables:** who will identify risks, develop mitigation strategies and contingency plans for their tasks and monitor risks. They report potential risk factors to their Work Package Leader.
- **Work Package Leaders:** who will consolidate risks and develop mitigation strategies and contingency plans on work package level. They report potential risk factors to the Project Coordinator and other WP leaders.
- **Project Management Team:** who is responsible for the risk management of the whole project, identifies risks, develops mitigation strategies and contingency plans, monitors risks and reports risk status in the periodic progress reports to the EU, including planned contingency measures.

In the end all partners are responsible for dealing with the risk factors and actions as sketched in the contingency plan.