

SPINMATE

Scalable and Sustainable Pilot Line based on innovative manufacturing technologies towards the industrialisation of Solid-State Batteries for the automotive sector

D9.1 Plan for Dissemination and Exploitation of Results - PDER

SPINMATE project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101069712.

Document details

Project Information	
Project Acronym/ Name:	SPINMATE
Project URL:	www.spinmate.eu
Project Type:	Research and Innovation Action (RIA)
EU CALL:	HORIZON-CL5-2021-D2-01-05 (Manufacturing technology development for solid-state batteries (SSB, Generations 4a - 4b batteries) (Batteries Partnership))
Grant Agreement No.:	101069712
Project Start Date:	01/08/2022
Project End Date:	31/07/2026
Document details	
Work package:	WP9 - Communication, dissemination and exploitation
Deliverable:	Plan for Dissemination and Exploitation of Results - PDER
Due date of Deliverable:	31st January 2023
Actual Submission Date:	Report Author(s): Marco Duarte, Ana Solange Leal (INOVA+)
Name of Lead Beneficiary for this deliverable:	INOVA+
Reviewed by:	Takwa Ben Issa, Rahul Gopalakrishnan (ABEE)
Revision:	2.0
Dissemination Level:	Public

Document History			
Version	Date	Comment	Modifications made by
V0.1	16.12.2022	Document Structure	Marco Duarte (INOVA+)
V1.0	23.12.2022	First Draft	Marco Duarte (INOVA+)
V1.1	29.12.2022	Review on Communication and Dissemination	Takwa Ben Issa (ABEE);
V1.2	29.12.2022	Review on Exploitation	Rahul Gopalakrishnan (ABEE)
V1.3	13.01.2023	Inputs on Exploitation interests	ALL PARTNERS
V1.4	26.01.2023	Structure and General review	Marco Duarte (INOVA+)
V2.0	30.01.2023	Final Review	Ana Solange Leal (INOVA+)

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Glossary and Abbreviations	
CDA	Communication and Dissemination Activities
CDE	Communication, Dissemination, and Exploitation
CDS	Communication and Dissemination Strategy
Gen 4b SSB	generation 4b solid state battery
KTA	Key Technological Area
PDER	Plan for Dissemination and Exploitation of Results
TBC	To Be Confirmed
TP	Technological Pillar

Contents

Executive Summary.....	7
1. Communication and Dissemination Strategy	8
2. Communication.....	9
2.1 Communication goal.....	9
2.2 SPINMATE communication strategy	9
2.3 SPINMATE communication targets and message	10
2.4 Communication Tools.....	13
2.5 Communication Material	15
3. Dissemination	16
3.1 Dissemination goal	16
3.2 SPINMATE dissemination strategy	16
3.3 Dissemination data Confidentiality	17
3.4 Scientific Articles	17
3.5 Events.....	18
3.6 Exploitation goal	19
3.7 Key Exploitable Results.....	20
Annex	25
Project Visual Guide.....	25

List of Figures

Figure 1 – SPINMATE Target Groups	11
Figure 2 – SPINMATE logo.....	13
Figure 3 – SPINMATE Website homepage	13
Figure 4 – Twitter homepage of SPINMATE	14
Figure 5 – LinkedIn homepage of SPINMATE	15
Figure 6 – Outcomes and Impacts of SPINMATE	20

List of Tables

Table 1 – Communication specificities per Target Group	11
Table 2 – Planning on participation on events during 2023	18
Table 3 – Exploitation Interests per Partner	21

Executive Summary

The aim of SPINMATE is to demonstrate a digitally driven proof-of-concept pilot line that is scalable, sustainable, safe, and cost effective as a first step toward the large-scale production of generation 4b solid state battery (Gen 4b SSB) cells and modules to support the electrification of the automotive industry.

SPINMATE processing and manufacturing innovations will contribute for:

- a sustainable and competitive large-scale production of SSBs;
- the reduction of the carbon footprint,
- enhancement of safety along the entire value chain, and SSB-based technologies development to
- achieve a mass electrification of the automotive sector.

This document is the first version (M6) of the Plan for Dissemination and Exploitation of Results (PDER) of SPINMATE project, to be updated by the end of the project (M48). The contents of the first release include an overview of the Communication, Dissemination and Exploitation (CDE) concepts, and the strategies and action plans followed to promote the project results, as well as to ensure their acceptance within future business opportunities.

This document is structured in two sections:

- **PART 1: Communication and Dissemination Strategy (CDS)** This section comprises a brief introduction to the concepts of CDS and the fine line that distinguishes one action from the other in terms of objectives, target audience, and methods. The CDS to be deployed by SPINMATE partners is appropriately structured. Moreover, several sub-sections are dedicated to describing the key messages we aim to transfer and the tools and channels used to deliver and promote those messages.
- **PART 2: Exploitation.** The second section of the document contains the exploitation vision of the SPINMATE project together with the guidelines that will constitute the basis for the project legacy on the exploitation of results. More specifically, this document provides a number of checklists allowing the characterization of the various exploitation results, identifying the “what” and the “to whom” will be targeted, as well as developing a first draft of suitable exploitation strategies through the identification of “products and services” and the respective potential “beneficiaries”. The exploitation strategies for SPINMATE will be continuously analyzed during the project. The PDER will be constantly updated to guarantee the quality of the implementation and several internal versions of the document, receiving contributions and revisions by the whole project consortium.

The final report will be delivered by M48, and it will be one of the most critical and relevant conclusions for the impact of SPINMATE and the further exploitation of its results beyond the project duration. Property rights, Foreground IP, and Background IP and all the IP claims or IPR management issues on project results will be addressed in the Exploitation activities roadmap report (D9.3).



1. Communication and Dissemination Strategy

Communication and dissemination activities (CDA) play an important role in increasing the impact of the project as both represent useful tools to raise awareness of EU funding opportunities, explain the societal relevance of the research, as well as support future research and innovation funding actions, and facilitate the creation of potential business opportunities

The boundaries between communication and dissemination are often indistinct and can overlap depending on the content to be transferred, as well as the target group addressed. The main aspects that differentiate these actions are their aim, focus, and audience. While communication aims to create awareness of the EU initiatives and promotes the project and its results to a very differentiated target audience ranging from stakeholders and investors to the media and great public, dissemination is focused on fostering the transfer of knowledge created during the project to make the results available for others to use. The target audience for dissemination is the scientific community, the industrial partners, and the policymakers. In the following sub-sections, both communication and dissemination strategies of the SPINMATE project are reported.

2. Communication

2.1 Communication goal

The glossary of the European Commission Research & Innovation Participant Portal defines the Communication of the project as a “strategically planned process that starts at the outset of the action and continues throughout its entire lifetime, aimed at promoting the action and its results. It requires strategic and targeted measures for communicating about (i) the action and (ii) its results to a multitude of audiences, including the media and the public and possibly engaging in a two-way exchange”.

- The main goal of communication is to reach out society, beyond the project own community, and promote the impact and benefits of the EU funded projects in a strategic and effective manner. The research activities carried out must be outlined with a language that multiple audiences can understand, including non-specialists. A list of communication guidelines has been defined as follows communication actions must be strategically prepared;
- Communication goals must be clearly defined before the action takes place;
- The language used to convey the contents and the contents themselves must be targeted and adapted to an audience that goes beyond the project's own community, including the media and the public;
- The way of communication must consider the gender equality guidelines defined in Deliverable D1.3.
- Communication action must convey a pertinent message that relates to the target group's daily life and operations;
- Media selection and interaction methods must be chosen and deployed: working at a local, regional, national, or EU level using a one-way exchange (website, social media, brochure...) or two-way exchange (exhibition, workshop...) method.

2.2 SPINMATE communication strategy

The partners will contribute to promoting the action and its results by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner.

This does not impact on dissemination obligations, confidentiality obligations, or the data ethical and security obligations, all of which still apply”.

SPINMATE's work plan is fully committed to communicating the project's results and their benefits for the stakeholders to the largest possible audience. SPINMATE communication measures have six key milestones:

1. Prepare content, graphical identity, and effective communication instruments:
 - a. Logo,
 - b. Website,
 - c. Banners,
 - d. Presentations,

2. Create marketing material and find communication channels to promote the project among the industrial stakeholders as well as audiences beyond the project's own community:
 - a. Flyer,
 - b. Newsletters,
 - c. Videos,
 - d. Newspapers,
 - e. Social media channels (Twitter & LinkedIn).
3. Promote SPINMATE to all target groups in EU and beyond (publications, industrial magazines and journals, participation in relevant external events, organization of project events - thematic workshops and final conferences);
4. Collect feedback from potential end-users and other target groups, thus facilitating SPINMATE tuning and improvements, as well as keeping end users' requirements updated;
5. Reinforce the brand-name of SPINMATE as a key-player in the SSB, physical asset management and maintenance market;

DEC strategies and actions are the cornerstone for generating a deep impact of the project's results during and beyond the project lifetime. DEC actions are articulated in the PEDR that will be undertaken within WP9. The backbone of PEDR consists of 3 different stages:

1| SEED (M1-M6) - It establishes the PEDR framework, planning of DEC actions and identifies promising project's results and research outputs;

2| FLOURISHING (M7 - M48) - It is focused on the creation of robust business plans and the dissemination and communication of the project's results and research outputs, and

3| HARVESTING (M49 - M84) - It is oriented to define the DEC commitments of the consortium beyond the project life in terms of DEC activities will execute to maximise the impact of the project results. In addition, PEDR will consider the development of key actions related to IPR and knowledge management, networking & co-creation activities with Policy makers and standardisation activities.

Communication KPIs: Creation of social media accounts (Twitter: 1-3 tweets/week & 300 followers; and LinkedIn: 150 members), and project website (25,000 visits) to promote SPINMATE results; Creation of communication materials (project identification, digital brochures, digital newsletters, promotional videos) to show the SPINMATE approach benefits, keeping them active beyond the project; Creation and promotion of press releases (2/y), communication articles (1/y) and interviews (1/y).

2.3 SPINMATE communication targets and message

Communication actions target stakeholders and groups covering the full range of potential users in manufacturing value chains as well as industrial and ICT/R&D communities.

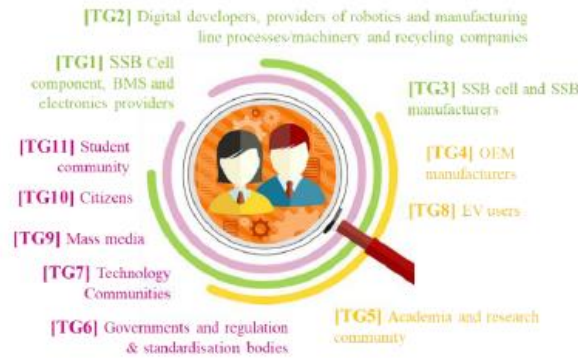


Figure 1 – SPINMATE Target Groups

Each communication activity will be tailored to the specific group and the message to be conveyed.

The table below gathers the main information that will be provided to the main Target Groups (TG) identified above.

Table 1 – Communication specificities per Target Group

Target Group	Type of information Main message
TG1: <u>SSB Cell Component, BMS and electronics providers</u>	<ol style="list-style-type: none"> 1) New generation of materials successfully tested in lab-environments for SSB applications and novel BMS concepts/architectures; 2) Novel manufacturing approaches and digital improvements that can be implemented in the fabrication of key materials for SSB batteries; 3) Requirements and specifications required by the battery industry and needed to satisfy in e-mobility and stationary energy applications.
TG2: <u>Digital developers, providers of robotics and manufacturing line processes/machinery recycling companies</u>	<ol style="list-style-type: none"> 1) New manufacturing technologies demanded by the battery industry; 2) To see how the battery industry sector evolves year-by-year and which manufacturing needs have the SSB assemblers to introduce new generations of batteries in large production environments; 3) Standards and regulation required to manage properly end-of-life (EoL) batteries in e-mobility sector, including second-life applications; 4) Digital twin solution providers for pilot and production lines
TG3: <u>SSB cell and SSB manufacturers</u>	<ol style="list-style-type: none"> 1) New generation of materials successfully tested in lab environments for SSB applications and novel BMS concepts/architectures; 2) New portfolio of materials offered by solid-state cell component manufacturers in order to consider them as key materials at the cell level; 3) New digital, robotics, machinery, processes, or recycling methods that can be incorporated into their manufacturing processes as cost-effective measures; 4) Standards and regulations required to commercialize products and services (cells, modules, or battery packs); 5) Requirements and specifications required by the OEM industry.
TG 4: <u>OEM manufacturers</u>	<ol style="list-style-type: none"> 1) New generation of SSBs and SSB cells successfully manufactured and tested in production environments that fulfil their demands for e-mobility and stationary energy applications; 2) Disruptive business models coming from circular economy approaches and/or potential second-life applications of EoL SSB.

Target Group	Type of information Main message
TG 5: <u>Academia and Research community</u>	<ol style="list-style-type: none"> 1) Battery industry interested to incorporate research and innovation (R&I) results in its tech. and manufacturing processes; 2) New R&I lines potentially interesting for their departments. 3) Exploitation agreements with the industry under know-how licensing or the creation of start-ups, spin offs or joint ventures.
TG 6: <u>Governments and regulation % standardisation bodies</u>	<ol style="list-style-type: none"> 1) Interest and commitments showed by local industry in the investments in manufacturing facilities; 2) Knowledge about the possibilities to create industry around key raw materials and the local leadership in key battery technologies; 3) Environmental & socio-economic impact from the materialisation of investments;
TG 7: <u>Technology Communities</u>	<ol style="list-style-type: none"> 1) New generation of SSB and solid-state cells successfully manufactured and tested in production environments that fulfil their demands for e-mobility and stationary energy applications; 2) Emerging and new R&I lines in the battery sector; 3) Battery industry interested to incorporate R&I results.
TG 8: <u>EV Users</u> TG 9: <u>Mass Media</u> TG 10: <u>Citizens</u> TG 11: <u>Student Community</u>	<ol style="list-style-type: none"> 1) Knowledge about the possibilities to create industry around key raw materials and the local leadership in key battery technologies; 2) New battery technologies will improve the current value proposition offered by the existing products and services in the market; 3) Improvements gained by EV thanks to the use of SSB batteries; 4) Environmental and socio-economic impact coming from the materialisation of investments; 5) Contribution of the battery sector to SDGs, Climate change mitigation and European Citizens Wealth; 6) Emerging and new R&I lines in the battery sector.

SPINMATE project will collaborate with related EU-funded projects and initiatives with common goals, supporting each other on dissemination of results and contributing to achieve the EU goals towards climate transition. SPINMATE will be collaborating with the following projects:

- **SOLID:** Sustainable Manufacturing & Optimized Materials and Interfaces for Lithium Metal Batteries with Digital Quality Control.
- **PULSELION:** Pulsed Laser Deposition Technology for Solid State Battery Manufacturing Supported by Digitalization.
- **HIDDEN:** Hindering dendrite growth in lithium metal batteries.
- **ADVAGEN:** Development of Advanced Next Generation Solid-State Batteries for Electromobility Applications.
- **HELENA:** Halide Solid State Batteries for Electric Vehicles and Aircrafts.
- **AM4BAT:** Gen. 4b Solid State Li-ion battery by additive manufacturing.

SPINMATE is part of the new formed consortium on lithium batteries manufacturing, and will be also collaborating with other clusters, including **solid4b**.

INOVA+ developed the branding material of SPINMATE project, illustrated in the SPINMATE visual guide – **Annex 1**. The logo and formats selected establishes the identify of the project. The concept development of the SPINMATE logo – Figure 2 – was to include a direct connection to the audience with batteries and electric vehicles.

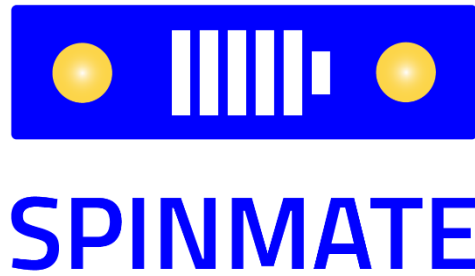


Figure 2 – SPINMATE logo

Blue is the main color, usually associated with electric vehicles, having Yellow as the second color representing car lights, giving a vibrant and enthusiastic feeling and contrasts sharply with blue. The typography has been selected both for presentations and reporting. The project logo is also available in other colors and backgrounds to be used according with the background where it will be applicable. Finally, the visual guide gives some examples on what not to do when using the project logo.

2.4 Communication Tools

The **project website** (www.spinmate.eu) is the primary communication channel of the project. Designed by ABEE, supported by INOVA+ on the project, the project website sets the project identity, establishing its identity within online channels used by SPINMATE stakeholders.

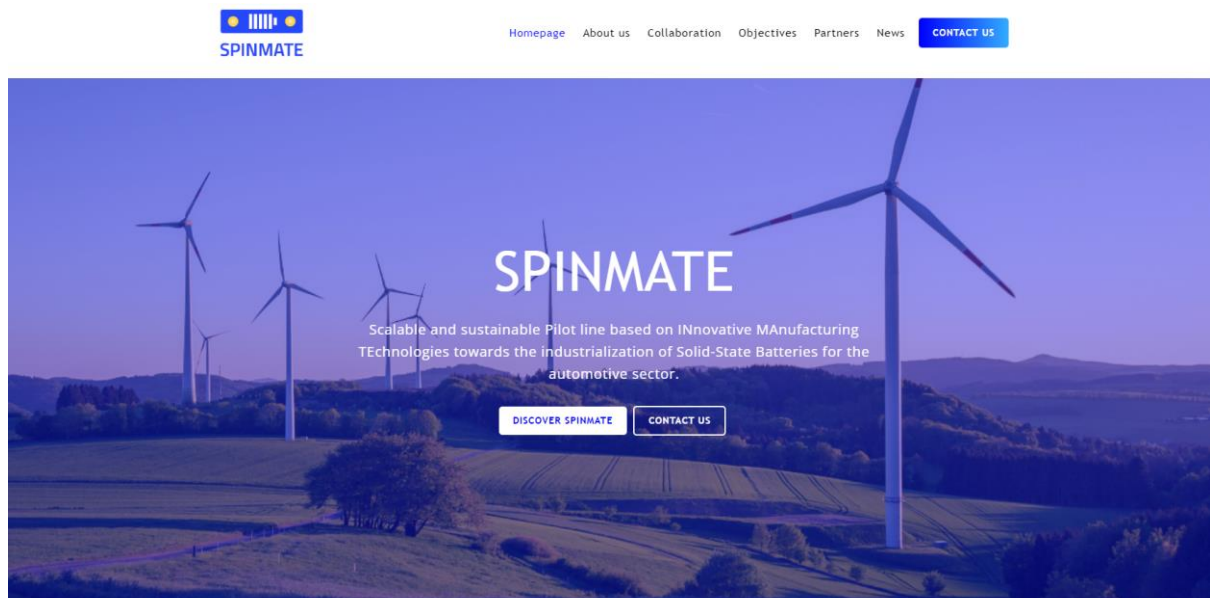


Figure 3 – SPINMATE Website homepage

The SPINMATE website introduces the project to the visitor. From the homepage – Figure 3 – the visitor will get a brief introduction to the project with a clear project ambition on sustainable and clean energy.

The website includes information about the project challenges and objectives, administrative information, and individual presentations for each partner. All the project deliverables, publications, and materials will become available in the project.

SPINMATE is present in **social media** on *Twitter* (https://twitter.com/spinmate_eu) and *LinkedIn* (<https://www.linkedin.com/company/spinmate>). The social media channels are regularly monitored by INOVA+, with a direct supportive role of ABEE and the involvement of all project partners to support the dissemination of publications as well as the identification of content for new publications based on the project findings.

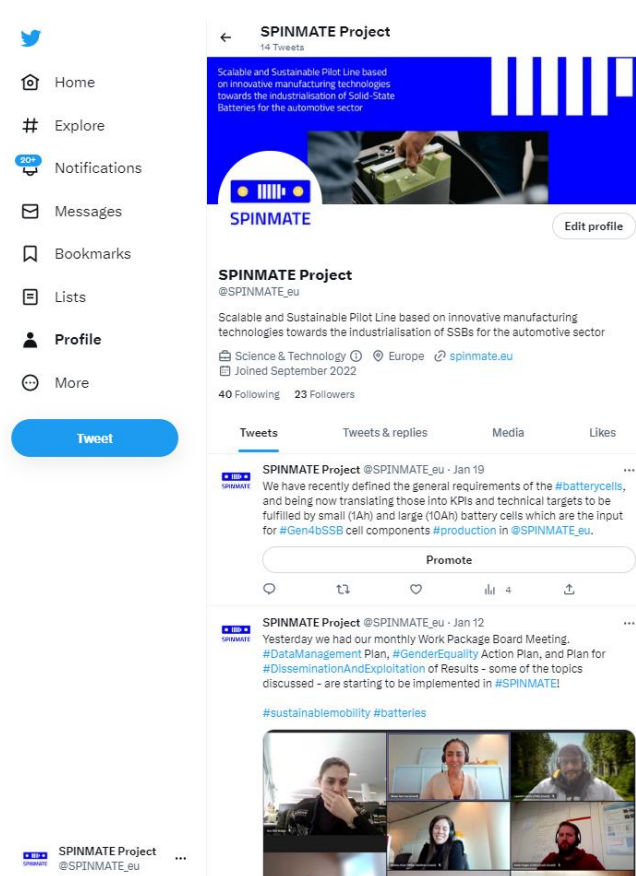


Figure 4 – Twitter homepage of SPINMATE

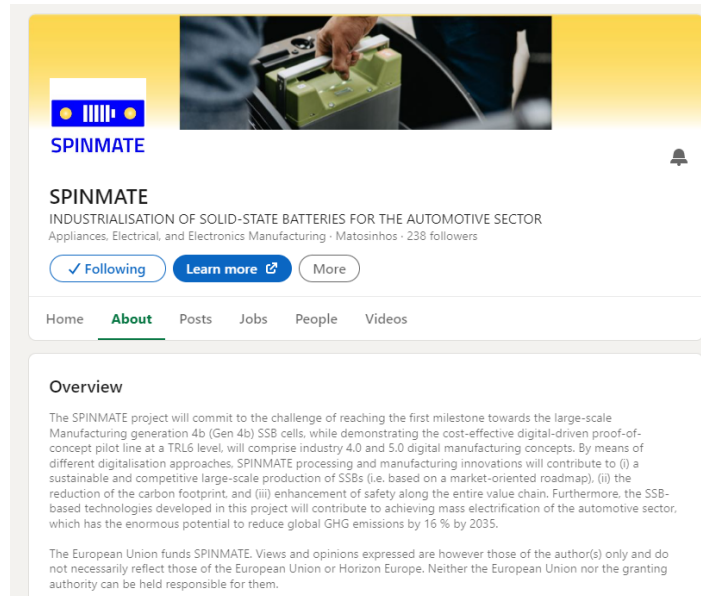


Figure 5 – LinkedIn homepage of SPINMATE

2.5 Communication Material

This subsection lists the communication material developed during the project. The communication material, listed by order of release, is the following:

- 1) **Triptych** – the three-folded flyer is an introductory “piece of information” to be shared inhand or in electronic format (QR code) at events as well on social media. This material is very useful for getting an overall idea about the project summarized in two pages. The Triptych was shared on social media on November 24th, 2022.
- 2) **Meet the Partners** – a series of questionnaires to the partners will be carried to support the dissemination of the project. In particular, the role of each partner and its main activities and expectations for SPINMATE. The collection of answers to this questionnaire started in January 2023, and is the answers will be publish as interviews on SPINMATE social media channels.

Note: This list will be updated throughout the project, listing the initiatives designed and materials developed to support project dissemination. For the upcoming actions, a Promotional Video and Poster are planned for the project's first year.

3. Dissemination

3.1 Dissemination goal

Compared to communication, dissemination activities are more focused on the results and solutions deriving from the project. The objective is not only to create awareness, but also to describe the results and the solutions to ensure understanding to enable others to use and take up results. Scientific community, industrial partner, policymakers are the audience addressed by dissemination activities since they might be the most interested in the use of the solutions provided by the project.

There are several benefits derived from a good dissemination strategy:

- Enhanced visibility of the project research line and drawing the attention of potential users of the project outputs;
- The gain in credibility within the scientific community and the possibility to find new additional funding sources or to collaborate with other projects/initiatives;
- Occasion to learn novel approaches and solutions thanks to the exchange of knowledge on all levels and the cross-fertilization of ideas.

3.2 SPINMATE dissemination strategy

SPINMATE dissemination management follows the best practices suggested by the EC Guidelines as well as the principles deriving from the well-established experience of the partners in other research projects:

- All the partners involved in the research activities will be made aware about the results of the project and the implications resulting from the outputs like publications and presentations.
- All the scientific articles on the results of the project will be duly reviewed by the relevant partners involved in the development of the topic of the publication.
- All the articles and publications on project outputs will be shared within the consortium before the date of disclosure.
- All the partners should contribute to the dissemination according to their role and effort by participating and giving presentations at conferences, workshops, meetings, by publishing papers, holding press conferences, networking, and similar activities.
- The Project Manager (PM) is the reference and contact point for every dissemination action. INOVA+ is in charge of constantly verifying the quality of the contents to be shared to ensure the correct implementation of the project results and the consistency between the events to be attended by the partners and the purpose of the dissemination activity.
- All public results will be accessible from the project website and usable from all parties who may benefit from them to maximize the impact of the project.

Any dissemination material developed in SPINMATE follows CINEA Communication and GDPR rules, by including the following disclaimer: *“The content of this document reflects only the author’s view and the European Commission is not responsible for any use that might be made of the information it contains.”*

To ensure the effective fostering of SPINMATE knowledge, the deployment of the dissemination strategy will consist in the identification of the following milestones:

- The topic and message of the dissemination action (the contents that will be shared).
- The target audience (who are the stakeholders to be addressed and that may have more interest for the topic).
- The messenger (the messenger should be a credible spokesperson who is expert of the subject to be disseminated).
- The methods and tools (the transfer method should be carefully considered depending on the nature of the event: the size of the audience, the background of the participants and the location).
- The expected outcome (the impact to be achieved and the purpose of the dissemination must be defined to optimally deliver the message).

3.3 Dissemination data Confidentiality

The dissemination activities are deeply entangled with the matter of Intellectual Property Rights (IPR) Protection since data and results belonging to the background and foreground of the project partners may be disclosed. The main aspects of IP rights protection are the following:

- The creation, within the consortium, of a common understanding and awareness between the academic world and the industrial partners of the different interests and motivations to publish project sensitive to avoid undesired breach of confidentiality among the partners. The willing of academic partners to publish is driven by its commitment toward the scientific community while industrial partner' decision is led by commercial considerations.
- The signing of common agreement on publication of confidential information or any other information subjected to the IP rights of one of the partners.
- The establishment of a set of rules and procedures to avoid the violation of the IP rights and to regulate the publication of data on project results.

no one within the consortium is allowed to publish any content involving other partners' foreground, background, or confidential data during and beyond the lifetime of the project without the written approval of the parties involved to avoid any breach of confidence. In case of disclosure of jointly owned results, each owner must be asked for its approval to publish without any possibility of withholding such consent. All draft articles and publications will be reviewed by the Project Coordinator, the Quality Manager, and by the Dissemination Manager before publication or production for reporting and archiving purposes. They will check the fulfillment of the dissemination requirements and if there is any already available prior art. Moreover, they will evaluate the possibility of making the content available on the SPINMATE website or not.

3.4 Scientific Articles

To reach the scientific community SPINMATE consortium promotes scientific paper publication and project presentation at scientific conferences targeting relevant domains for the project. The expected impact of presentations at these kinds of events is very high because of the attendance of scientists and industrial stakeholders.

In addition to the pure scientific papers, the results and impacts of the SPINMATE project will be communicated to professionals, end-users, and industries through papers in technical bulletins and sectorial journals.

3.5 Events

From M7, SPINMATE partners will be participating in external events, supporting the dissemination of SPINMATE, and strengthening the network for potential new collaborations. With the support from BEPA, INOVA+ and ABEE are working closely on the identification of events and assisting the partners with the preparation of the supportive material in line with the role of the partner(s) at the expected event to participate. The following table presents the list of events of 2023 relevant for SPINMATE in which partners are planning to participate.

Table 2 – Planning on participation on events during 2023

Name	Dates	Location	Participation
Autosalon	13-22 January	Brussels, BE	ABEE
IWES 2023: Second Italian Workshop on Energy Storage	25-27 January	Bressanone, IT	COMAU
Battery Conference 2023	26-28 April	Aachen, DE	TUBS, ISCF
The Battery Show Europe 2023	23-25 May	Stuttgart, DE	ABEE, IREC, CID, COMAU, ISCF, CPT
13th Advanced Automotive Battery Conference (AABC Europe)	19-22 June	Mainz, DE	CID, ABEE, TME, COMAU, ISCF, CPT
18th European Conference on Solid State Chemistry ECSSC 2023	09-12 July	Prague, CZ	IREC
Battery Cells & Systems Expo	28-29 June	Birmingham, UK	CPT
ISE 74th annual meeting	3-8 September	Lyon, FR	CICe
ICPCET 2023: 17. International Conference on Power and Clean Energy Technologies	20-21 September	Lisbon, PT	INEGI, INOVA
244th ECS Meeting	8-12 October	Goteborg, SE	CID, CICe
Batteries Event 2023	10-13 October	Lyon, FR	ARKEMA
ICCPMS 2023: 17. International Conference on Climate Protecting Energy Management Systems	25-26 October	Barcelona, ES	INEGI
Battery Innovation Days 2023	TBC	TBC	CID, ABEE, COMAU, IREC

Dissemination KPIs: Participation in 3 scientific conferences/year and publication of 3 scientific articles/y to disseminate the SPINMATE materials related achievements; Organisation of 2 international events (M24, M46) to disseminate SPINMATE achievements and processing innovations and approaches. Participation in 2 fairs/workshop/year. Participation in 2 clustering workshops and organisation of 1 clustering session.

3.6 Exploitation goal

According to the European Commission glossary, Exploitation is defined as *“The utilisation of results in further research activities other than those covered by the action concerned, or in developing, creating and marketing a product or process, or in creating and providing a service, or in standardisation activities.”*

The concept standing behind the definition of exploitation, which is also the ultimate feature of the activity itself, is indeed the effective and concrete use of the achieved project outcomes. The exploitation aims at using Research and Innovation actions to create a concrete impact for the society, with the expectation that the exploitable results will be used beyond the lifetime of the project.

Task 9.1 is addressed to write the PEDR. Thus, the deliverable related to this task is intended as a report of all the activities performed through the journey of exploitation: starting from the identification and characterization of the project results, going through the formulation of an exploitation strategy and the management of the IPR, to finally end with the identification of the market opportunities and the active stakeholder involvement.

The Horizon Europe programme defines project outcomes as *“Any tangible or intangible output of the action, such as data, knowledge and information whatever their form or nature, whether or not they can be protected, which are generated in the action as well as any attached rights, including intellectual property rights.”*

To be successful in writing the exploitation plan it is essential to start with the identification and characterization of the exploitable results. Indeed, not all of what has been achieved throughout course of the project is likely to have an exploitation route. Exploitable results are only those having a potential scientific, economic, and social significance. During the project these outcomes provide a mechanism to capture and quantify impact, while, by the end of the project, a way to achieve impact beyond project’ s completion.

The PEDR is an evolving report that will be periodically updated according to the emerging results of the project, the changes in the stakeholders or work context and their potential use during the project lifetime.

Exploitable results do not necessarily correspond to a product or a service. There are six categories from which exploitable results may belong to:

- **Equipment** - the machinery or tools needed to carry out a job; a set of physical tools, devices, kit assembled for a specific purpose.
- **Processes** - A systematic series of mechanized or chemical operations that are performed to produce something.
- **Products** - something that is made to be sold, usually something that is produced by an industrial process (as a custom but may be personalized upon request).
- **Services** - offering the above products, processes, equipment, or knowledge as a help to perform a work.
- **Knowledge & IP** - understanding of or information about a subject that you get by experience or study, either known by one person or by people generally
- **Other forms of knowledge** - Platform, publications, patent.

The SPINMATE’s exploitation strategy is coordinated by INOVA+, and it was conceived to articulate a set of exploitation activities oriented to increase the impact of the project results during and after the end of the project, reinforced by the implementation of Open innovation practices. The strategy pays special emphasis on the use of the project results for commercial purposes to tackle societal problems and/or in policy making. In this sense, SPINMATE will establish a clear path where it will be shown how the project results will contribute to reach the expected outcomes and long-term impacts.

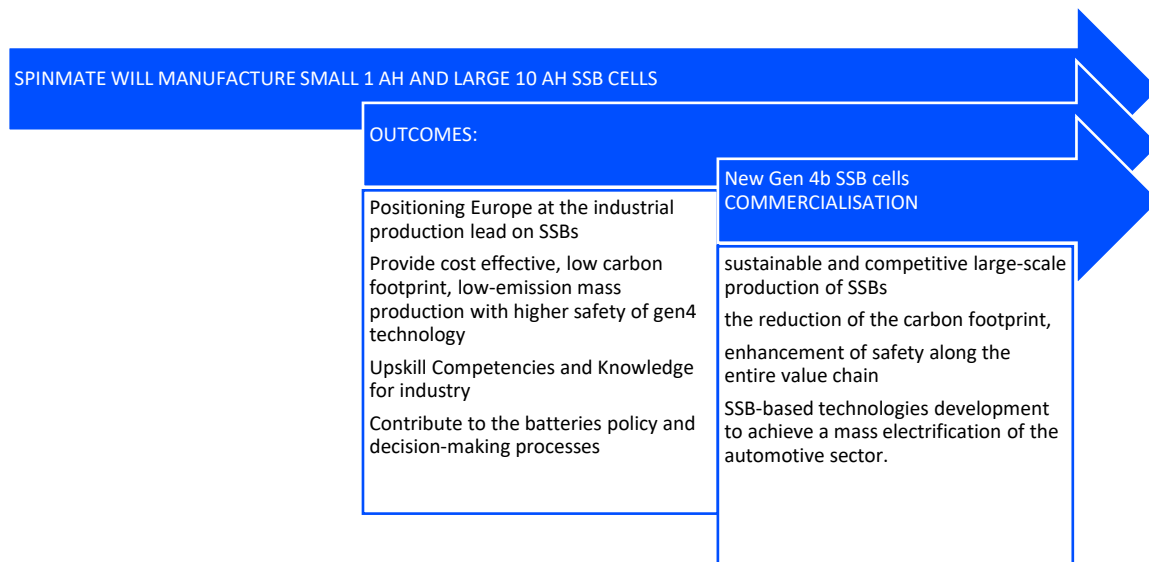


Figure 6 – Outcomes and Impacts of SPINMATE

Exploitation KPIs: Definition of an exploitation strategy in 3 phases: (1) Exploitation seed to identify the project results and research outputs with business and innovation potential; (2) Exploitation flourishing to generate business model and development of business plan; (3) Exploitation harvesting to exploit the results beyond the project.

3.7 Key Exploitable Results

The project results have a high business and innovation potential for the SPINMATE consortium and will be exploited through the exploitation strategy above-mentioned. Also, these results will serve as inputs for the first step - Identification - of the Exploitation strategy explained. Beyond the implementation phase, the SPINMATE’s consortium is committed to work on the following exploitation activities after the end of the project: industrial upscaling & technology refinement (from TRL6 to TRL8), development and implementation of the go-to-market/commercial plan, definition of specific products/services linked to the exploitable results, formalisation of business agreements, implementation of funding and investment plans to scale-up the results until a market uptake stage (TRL7), certification of future products/services and activation of IPR mechanisms linked to the exploitable results and keep alive FTO analysis. The Table below presents the exploitation interests from each partner in SPINMATE under the Technological Pillars (TP) of the project and their respective Key Technological Areas (KTA).



Table 3 – Exploitation Interests per Partner

TP	Development, Optimisation And Upscaling Of SSB Cell Components		Digitalisation and modelling for ssb cell manufacturing		Pilot line optimisation and demonstration	
	Solid Polymer Electrolyte	Li metal anode	Ni rich NMC based Cathode	Digitalisation approaches for the assembly and manufacturing at the pilot line level	Simulation of a digital-driven manufacturing environment: industrial upscaling	Proof-of-concept pilot line towards Gen 4b SSB cells manufacturing
P1: ABEE						<p><u>Equipment</u>: Assembly line for SSB.</p> <p><u>Knowledge & IP</u>: Know-how on processing and manufacturing of small and large battery cells. Business Opportunity / IP Protection: New engineering services regarding smart, flexible and green manufacturing of next generation SSB cell technologies secured by trade secret.</p>
P2: ISCF						<p><u>Equipment</u>: Assembly line in Glovebox.</p> <p><u>Processes</u>: Mixing, coating and lamination processes for polymer SSB Systems.</p> <p><u>Products</u>: Monolayer cells, taylored polymer compositions.</p> <p><u>Services</u>: R&D Services.</p> <p><u>Knowledge & IP</u>: Processing and manufacturing on cell level. Broad polymer electrolyte know how and patents.</p>
P3: COMAU				<p><u>Products</u>: Models of all the process steps of gen4b cell manufacturing.</p>	<p><u>Products</u>: Model of the whole production process, considering a large-scale (giga) environment.</p>	<p><u>Equipment</u>: Cutting tools for new electrode and separator materials; handling systems for stacking gen4b cells based on metallic lithium</p>





				<p>Knowledge & IP: Knowhow about the correlations among process parameters, to provide a forecast of the final product quality and tools for rework strategy and predictive maintenance.</p>	<p>Knowledge & IP: Assessment of the efficiency of the developed manufacturing processes and equipment applied to an industrial scenario.</p>	<p>and polymeric / hybrid electrolyte.</p> <p>Processes: Products: Equipment for gen4b cell assembly.</p> <p>Knowledge & IP: Knowhow about handling of new electrode and electrolyte materials for gen4b cell assembly.</p>
P4: TUBS				<p>Processes: Modelling of process-structure-property relationships for the scalable production of polymer SSB cathodes.</p> <p>Products: Process models.</p> <p>Knowledge & IP: Knowhow about the correlation between processing and the resulting properties of polymer SSB cathodes.</p>		<p>Equipment: Small pilot line under dry room conditions.</p> <p>Processes: Mixing and dispersing, (extrusion), coating and drying, calendaring, cell assembly.</p> <p>Products: Mono- and multi-layer polymer solid-state battery cells.</p> <p>Knowledge & IP: Know-how on processing and manufacturing of small and large solid-state battery cells with polymer solid electrolyte via scalable methods.</p>
P5: TME	Other forms of knowledge (Publication of results on scientific and non-scientific magazines and on different media).					
P6: CEA						<p>Knowledge & IP: Improvement of SSB cells analysis, tests, and safety Use of new sensors for tests SSB material analysis with safe procedures.</p>
P7: CID	<p>Processes: SPE integration in Geb4 SSB.</p> <p>Services: Internal use, further R&D, industrial contracts.</p>	<p>Processes: Li handling and integration in Gen4 SSB.</p> <p>Services: Internal use, further R&D, industrial contracts.</p>	<p>Processes: Conditions for SSB cathode production.</p> <p>Products: Cathode for SSB.</p>	<p>Processes: Manufacturing process of advanced SSB.</p> <p>Products: Advanced SSB.</p> <p>Services: Internal use, licensing, and</p>		<p>Processes: Manufacturing process of advanced Gen4 SSB.</p> <p>Products: Advanced Gen4 SSB.</p>



	<u>Knowledge & IP</u> : trade secret.	Knowledge & IP: trade secret.	<u>Services</u> : Internal use, further R&D, industrial contracts. <u>Knowledge & IP</u> : trade secret and patent.	further R&D. <u>Knowledge & IP</u> : trade secret.		<u>Services</u> : Internal use, licensing, and further R&D. <u>Knowledge & IP</u> : trade secret and patent.
P8: CICe	<u>Processes</u> : Solvent-free processing of solid polymer electrolytes (with or without Garnet). <u>Products</u> : Polymer electrolyte with high ionic conductivity and electrochemical stability. <u>Knowledge & IP</u> : Patents, publications.		<u>Processes</u> : Cathode solvent-free processing; Integration of polymer electrolyte on cathode layer. <u>Products</u> : Extruded cathode. <u>Knowledge & IP</u> : Patents, publications.			
P9: ARKEMA	<u>Processes</u> : Solvent process to produce the electrolyte and catholyte; A solvent-free processing route for the electrolyte assembly, avoiding the use of toxic organic solvents and decrease the processing costs. <u>Products</u> : A novel solid polymer electrolyte, with high ionic conductivity (ca. $10^{-3} \text{ S cm}^{-1}$ at room temperature) and a wide electrochemical stability ($>4.4 \text{ V vs Li}^+/\text{Li}$). <u>Knowledge & IP</u> : Freedom to operate or licensing.					
P10: INEGI						<u>Knowledge & IP</u> : Gain of knowledge regarding the main parameters and drivers for sustainable manufacturing of SSB to support relevant national stakeholders and industry.



						<p><u>Other:</u> Matured digital data platform tool for support in handling large datasets of life cycle inventories for sustainability assessments; Publication of results in scientific journals and national relevant media.</p>
P11: IREC			<p><u>Processes:</u> Active material, electrolyte and additives processing conditions to optimize performance. <u>Products:</u> Cathode for SSB.</p> <p><u>Services:</u> Internal use, further R&D, industrial contracts.</p> <p><u>Knowledge & IP:</u> Publications and patents.</p>			
P12: CPT			<p><u>Equipment:</u> optimize equipment and parameters for manufacturing of cathode materials.</p> <p><u>Processes:</u> Protocols for manufacturing of cathode materials.</p> <p><u>Products:</u> Ceramic oxide powders for cathode materials.</p> <p><u>Knowledge & IP:</u> FTP, Patents.</p>			
P13: INOVA+	Other forms of knowledge (Publication of results on scientific and non-scientific magazines and on different media).					



SPINMATE

Scalable and Sustainable Pilot Line based on innovative manufacturing technologies towards the industrialisation of Solid-State Batteries for the automotive sector

Annex

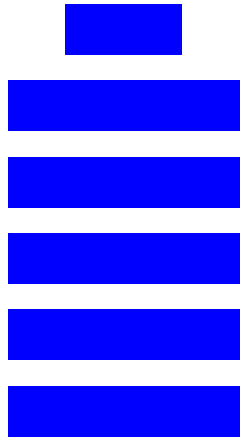
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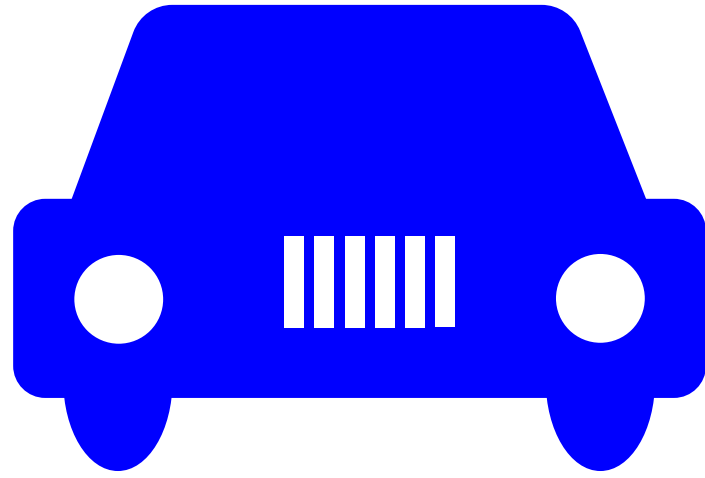
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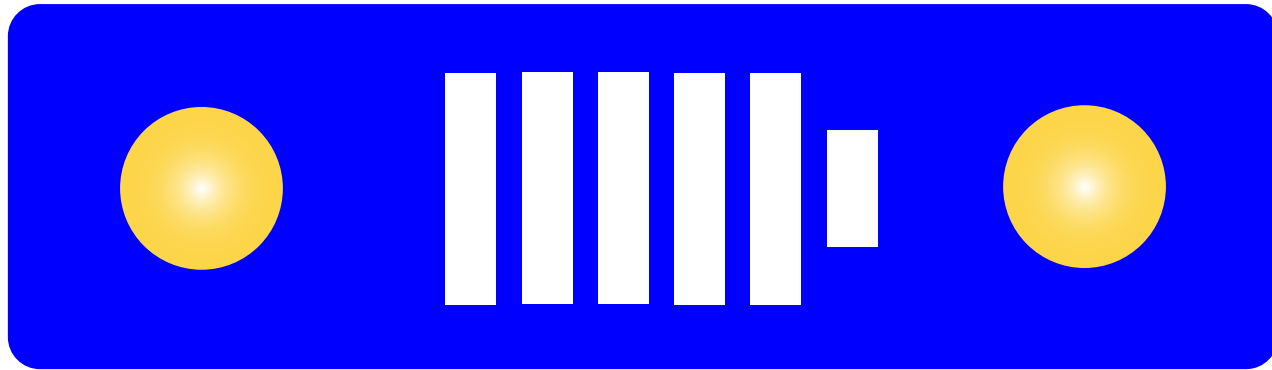


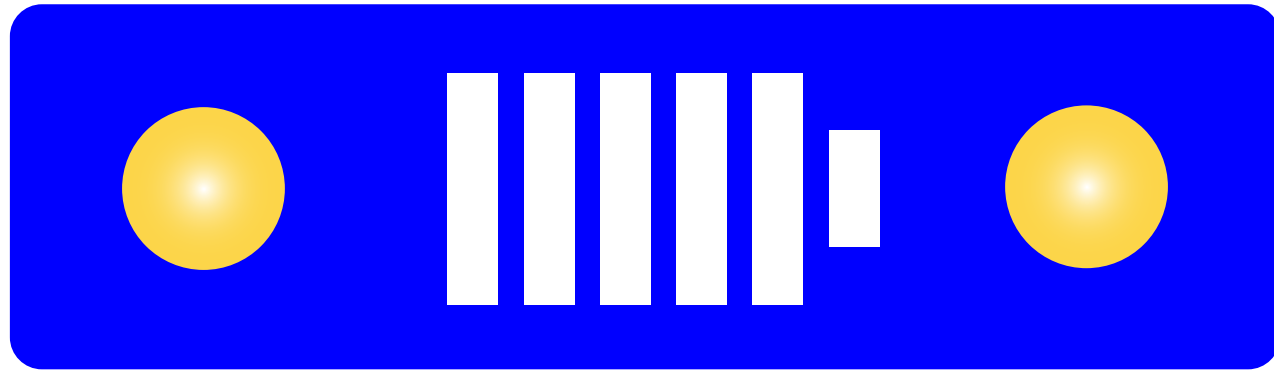
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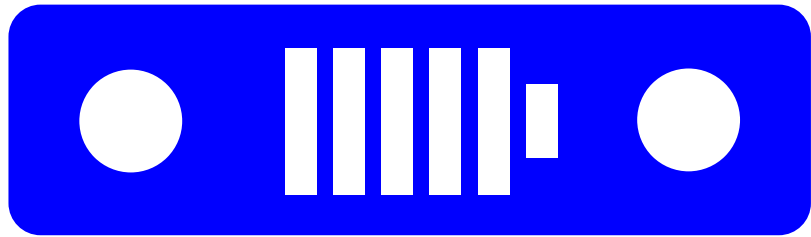
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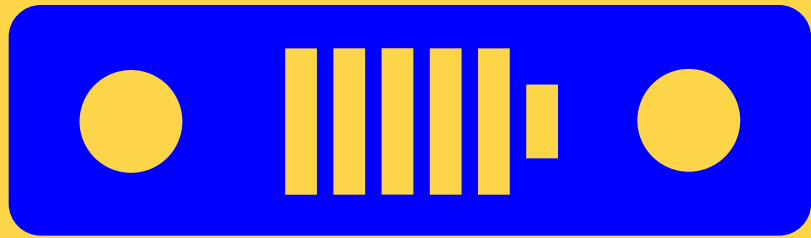
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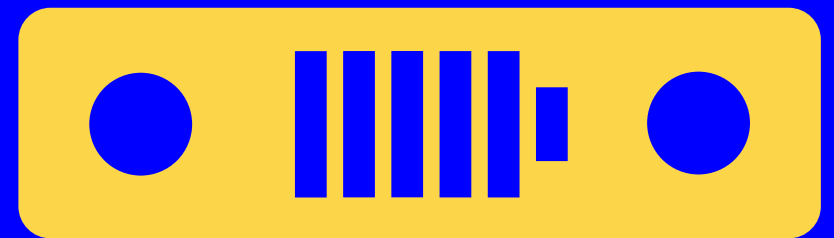
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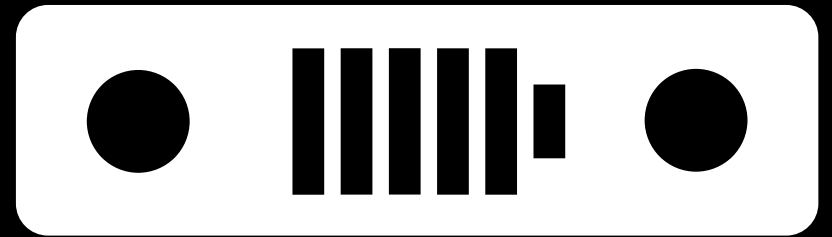
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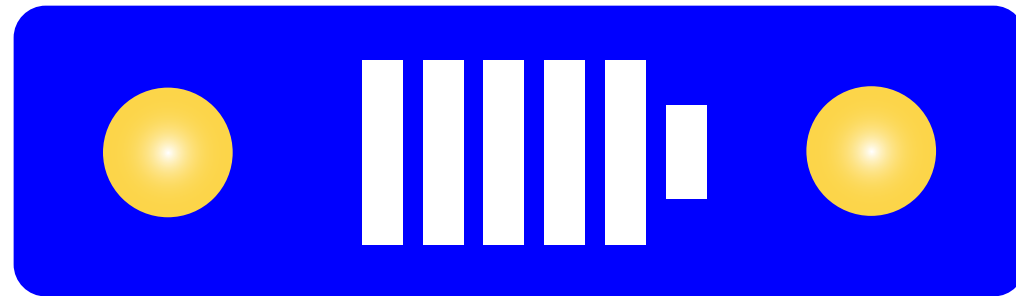
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COLOR

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R: 0 G: 0 B: 255

C: 93 M: 75 Y: 0 K: 0



SPINMATE

#FCD549

R:252 G:213 B:73

C:2 M:16 Y:78 K:0



SPINMATE

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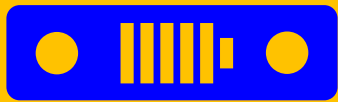
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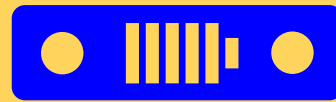
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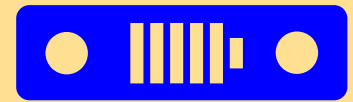
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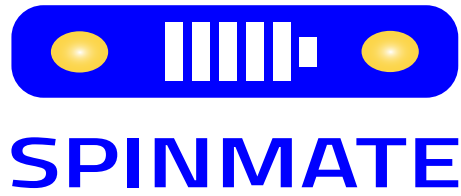
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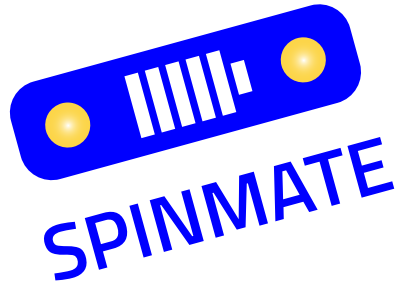
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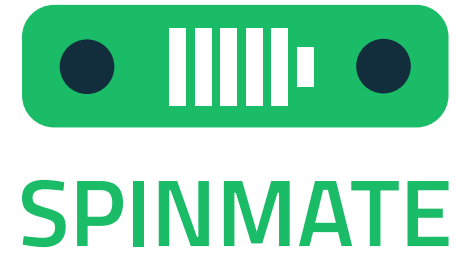
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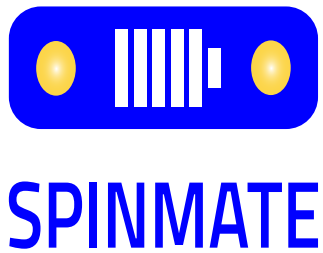
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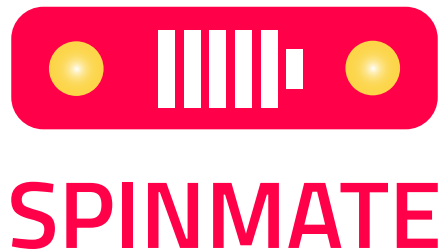
DO NOT ROTATE



DO NOT USE DIFFERENT
COLOR SCHEMES



DO NOT STRETCH



DO NOT USE DIFFERENT
COLORS



DO NOT RESIZE UNTIL
UNREADABLE