

Meet the SPINMATE Partners!

INOVA+, responsible for conducting the communication and dissemination activities in SPINMATE, conducted a series of interviews to the project partners.



SPINMATE



Introducing Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI): an industry-oriented Research and Technology Organization (RTO) with an organizational structure based on research, innovation and technology transfer, covering new technologies for advanced production processes, mechanics, new materials, sustainability & efficiency, product development, systems and biomechanics. The infrastructure has well-equipped laboratories and extensive engineering tools for supporting R&D activity as well as the production of industrial or commercial prototypes.

<http://www.inegi.pt/pt/>

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Hello Inês Ribeiro and Joana Gouveia! Thank you for this opportunity to meet you and talk about SPINMATE. To kick-off, could you give us, in your own words, a short introduction to INEGI, and your role there?

INEGI is a Research and Technology Organisation (RTO). We develop activities of research and technology-based innovation, technology transfer, consulting and advanced engineering and training services, oriented to the development of the industry and the economy in general. **INEGI** has expertise in developing sustainability studies of products and systems. We are sustainability researchers in **INEGI**, and we are part of the Sustainable Product & Systems Development team. The team mostly works on developing and advancing life cycle thinking approaches (e.g. digital tools, machine learning, AI-models, etc.), as well as conducting Life Cycle Assessment (LCA) studies together with cost analysis and social issues to support sustainable innovation and research.

To someone reading this who is still not familiar with SPINMATE, how would you describe it in simple terms, and how do you distinguish it from other projects or initiatives?

With the urgent need to transit for a carbon neutral mobility, the electrification of transport sector is a must, in which **SPINMATE** plays an important role. Along with contributing for the decarbonisation goals, **SPINMATE** project looks to introduce innovative new techniques to potentiate large scale manufacturing of Solid-State Batteries (SSB), in pair with accelerating its cost-reduction, energy savings and enhance its safety. Besides this, **SPINMATE** looks to adopt industry 4.0 and industry 5.0 concepts, promoting the digitalisation, sustainability and resilience of its manufacturing chain.

INEGI is the leader of the environmental and cost impact assessment through the value chain in SPINMATE. Could you briefly present the Digital Data Platform which will be used to conduct the Life Cycle Assessment analysis?

The Digital Data Platform (DDP) is a online platform for data gathering. This platform, now called SUNDIAL, is a digital tool developed to support life cycle data gathering, storage, data safety and confidentiality. Life cycle studies imply dynamic interactions between parties during data collection and sharing, for further treatment and analysis. All these phases can be very challenging, regarding the data complexity, quality, large quantity and time required for its collection and processing. Consequently, those phases are highly time-consuming and there was a need to enhance their productivity.

In this context, SUNDIAL was created to fight those disadvantages by facilitating these interactions, supporting the creation of life cycle inventories (LCI), data management and sustainability assessment, for its users (LCA professionals and data suppliers). In this project, SUNDIAL will support **INEGI** in these tasks, to assess the environmental and economic performance of **SPINMATE** project.

Given that the LCA studies will drive the data requirements and storage specifications for the SUNDIAL development, what specific environmental metrics and lifecycle stages should be prioritized in the design of the SSB to ensure optimal alignment with sustainability goals?

This digital technology focuses on the collection of mass and energy flows, in physical and monetary units. The mass and energy flows are necessary for the conduction of the environmental and economic performance analysis, that is, the inputs and outputs that occur in **SPINMATE**'s processes during Solid-State Battery (SSB) manufacturing, per example: materials, fuels, liquids, waste, process efficiency, transportation, etc.

In terms of design, all the life cycle phases of the product system are taken into consideration. The main goal is to identify the major environmental and cost contributors (materials and phases) and understand how they can be optimised, so that an environmental-friendly and cost-effective pilot line can be developed.

Which parameters/resources will be analysed in SPINMATE for the development and implementation of the data-driven Cost Analysis model?

We are responsible for the cost assessment of the SSB system - a task that has recently started - so it's quite premature to declare what exactly will be implemented. Yet, we are planning to follow Life Cycle Cost (LCC) and Material Flow Accounting (MFCA) approaches. Based on this, we intend to map the costs that occur during the life cycle of the SSBs, having in mind the interests of its stakeholders, whether they are manufacturers, users or recyclers.

What are you personally most enthusiastic about achieving during SPINMATE?

We are very attentive in **SPINMATE**'s role on the support of a more competitive and sustainable European battery value chain! The results from this project will achieve a new paradigm in large-scale battery manufacturing, taking into consideration important environmental & economic sustainability indicators for the development of **SPINMATE**'s pilot line.

INEGI is a wide expert on the development of sustainability tools. How the life cycle models developments that simulate the environmental and economic performance within SPINMATE scope will contribute to INEGI mission?

INEGI aims to be an agent that supports the development of industry and economy, through scientific and technology-based innovation. Without a healthy environment, there is not a healthy economic growth, which consequently affects the industry. Climate change is one of the many examples on how the environment affects and is affected by the industrial development. Per instance, this phenomenon increases the occurrence of natural catastrophes, which imply loss and damage for the industry (infrastructures and services), contributing for the destabilization of the market and economy, pairing with the fall of prosperity and wealth. Therefore, it is fundamental to understand these connections, in which **INEGI** develops research to promote sustainability development.

SPINMATE is currently developing a large-scale manufacturing pilot line for SSB. **INEGI** will take on this challenge by assessing environmental and economic sustainability of the developed solutions and ensure that the best performance is achieved. In doing so **INEGI** will support **SPINMATE** partners on this regard and also contribute for its own purpose: support the development of the industry and the economy, based on the conscious and sustainable conception of products and systems.

The developed life cycle models, as well as the sustainability results, are part of **INEGI**'s strategic mission to further expand research for knowledge transfer and innovation activities, as well as encourage collaboration in national & European research initiatives. In

addition, SUNDIAL will support competitiveness regarding research capacity & exploitation of new research fields connecting to digital sustainability.

Certainly, there will be readers interested to meet you and discuss your experience in SPINMATE. Which events will be possible to meet INEGI in the upcoming months (name of the event, date, location)?

Our agenda for this year isn't defined yet. Meanwhile, you can reach us through LinkedIn or Twitter. Events will be advertised in our professional accounts and INEGI social media, as well as INEGI website: www.inegi.pt/en



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