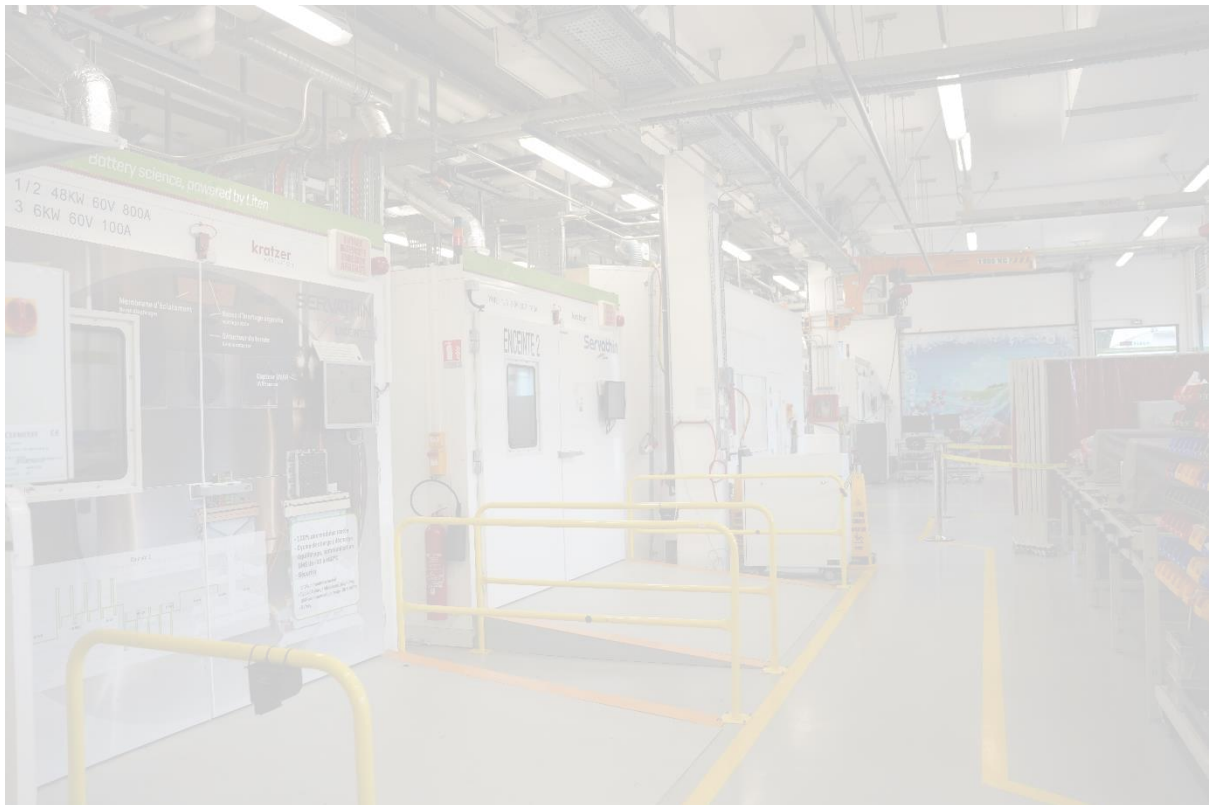


Meet the SPINMATE Partners!

MEET:



Introducing Commissariat à l’Energie Atomique et aux Energies Alternatives (CEA): Located in Grenoble and Chambéry, CEA-Liten institute is part of CEA and is dedicated to the energy transition. Its activities focus on several key areas: solar energy, network management, batteries storage and hydrogen in order to improve energy efficiency and circular economy approach. CEA-Liten covers a wide range of applications in energy production and distribution, transportation and industrial processes.

<https://liten.cea.fr/cea-tech/liten>

WWW.SPINMATE.EU

Hello Anh-Linh! 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 CEA, and your role there?

CEA is the French Alternative Energies and Atomic Energy Commission. It is a major research organization since we are more than 20,000 employees. We address both pure research and applied research, since we have many research subjects directly with industrial companies. CEA has a strong role to contribute to the reduction of carbon emissions. We develop new technologies such as fuel cells or batteries for instance. I am at CEA LITEN institute, in Grenoble, where I work on lithium-ion batteries for transportation applications.

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?

In SPINMATE, we develop a new generation of lithium-ion battery for future electric or hybrid vehicles. It is a solid-state battery, where the classical liquid electrolyte is replaced by a solid electrolyte. It will provide improved performance and higher safety. The particularity of SPINMATE is that we are going not only to define and assemble some solid-state batteries, but we will also set-up a small scale manufacturing line. We really are at the first stage of a real industrialization. We will have a small manufacturing line, the battery cells manufactured from this process line, and we will also test them to check their performances according to automotive specifications.

CEA is the leader of testing and validating SSB cells performances, ageing, and safety in SPINMATE. Could you describe to us how will be the testing environment, ensuring that performance achieves the pre-defined KPIs so the results can be replicable?

Exactly: in SPINMATE, with the project partners, we will test the solid-state batteries for performances, for ageing, and for safety. We will use different dedicated test facilities depending on the type of test. The test protocols will be precisely agreed between partners and the test conditions will be monitored all along the tests. For instance, we will define the initial conditions, the test profile, and we will measure or control the current, voltage, temperature and pressure of the cells. We will use climatic chambers for most of the tests. We will also reproduce the same test on several cells to check the reproducibility of the results.

SPINMATE has a strong focus on the reduction of environmental impact on sustainable mobility. Considering CEA role – which degradation mechanisms from SSB cells will be conducted? Which safety measures and risk factors will be considered?

We know that a battery with a long lifespan is very positive for sustainability. The battery cells' performance degradations with time (or ageing mechanisms) are therefore among the main points that we will investigate. We will dismantle and analyse the battery cells, their materials, the interfaces inside the cells, thanks to several technics (electrochemistry, use of smart sensors, nano-characterization, etc.). We will apply the analysis on new cells, but also on tested cells including aged cells. In parallel, the battery cell must also of course be completely safe. We will then apply abusive tests such as runaway energy measurement, and electrical, thermal and mechanical tests related to safety. A safety study of the

manufacturing line will also be done to extend the safety analysis to the manufacturing of the cell and be sure that there is no risk for the operators or for the outside environment.

What will be the main goal for the performance demonstration of battery cell and module prototypes in SPINMATE? Is it planned to test driving profiles and scenarios in order to meet automotive standards?

The objective is to demonstrate that the battery cell developed in SPINMATE fulfils the specifications of a real automotive application. To prove this, we will assemble a module prototype and we will validate it according to typical usage profiles representing an electric vehicle application: driving, charge, etc. The usage profiles will be defined with the end-user and we will also consider the automotive standards as a baseline.

What are you personally most enthusiastic about achieving during SPINMATE?

I am very happy to contribute to the development of an innovative battery altogether with all the partners of the project. Each partner has a very strong knowledge, and we are going to share and learn many things. I am waiting impatiently for the first cells to know their performances. In **SPINMATE**, we have the chance to develop very concrete products: cells, a pilot line, a module tested in representative conditions. There are many things that we will do for the first time. Then, some results will be fine at first, others will need more effort and ideas from partners to reach the targets. It is a team challenge, with very concrete results and products at the end. Additionally, what is extremely important to me, is that the technology that we are going to develop will also be assessed on the environmental part: a life cycle analysis will be done, and recycling will be studied. I feel this is essential to give sense to our work and be convinced of our new technology.

CEA is an expert in the development of new technologies for Li-ion and post Li-ion batteries, fuel cells, PEM electrolyzers and hybridization of electrochemical systems. How SPINMATE will be strengthening your position? Which will be the main benefits of CEA by participating in this collaborative project?

CEA has a strong experience in lithium-ion batteries, but even if there already are several projects on solid-state batteries, many things are not resolved nor demonstrated yet for the technology. This is the case for instance of the battery safety, which is a major subject for **CEA**. During the project, we will develop new protocols to dismantle, analyse, and test the solid-state batteries in safe conditions. We will also measure the thermal runaway of the cells, which will give us new information about the behaviour of the solid-state battery cell for safety. Another point is the analysis of the cell. For **SPINMATE**, we will use new smart sensors to measure the temperatures and pressures inside the battery cells. This is something that we already have started to test, but here we will use new sensors to get a much higher resolution. For the material and cell's structure analysis also, we will improve our analysis technics and apply them to solid-state batteries.



Anh-Linh

Research engineer on
battery systems

INOVA+ – responsible for implementing the communication and dissemination activities in SPINMATE – conducted a series of interviews to the SPINMATE partners. If you would like to know more about the project partners, visit our online channels.

SPINMATE Website: www.spinmate.eu

SPINMATE Social media channels:



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