



HighMag partners meet in Freiburg to advance magnesium battery tech

FREIBURG, Germany - 17 June - With volatile raw material markets forcing Europe to rethink its dependence on lithium, scientists and industry leaders are looking closely at an alternative right beneath our feet: magnesium.

Last week, the EU-funded HighMag consortium met at the University of Freiburg to review progress on a new generation of batteries designed to power future electric vehicles and energy grids.



Led by the AIT Austrian Institute of Technology, the HighMag project is working to take magnesium batteries out of the lab and get them ready for real factories. Because magnesium is cheap, safe, and incredibly abundant in the Earth's crust, it offers a realistic way for Europe to build its own independent supply chain.



The intensive, one-day session brought together researchers from top-tier institutions to tackle the chemistry from two different angles. Instead of betting on just one solution, the team is developing both magnesium-sulphur and magnesium-metal systems at the same time.

The meeting began with opening words from the host, Prof. Ingo Krossing from the University of Freiburg (UFR), and the project coordinator, Yuri Surace from the AIT Austrian Institute of Technology, setting a collaborative tone for the day.

The sessions focused on cracking technical bottlenecks across the entire development cycle, with updates structured around the project's core Work Packages (WPs):

- **Project Management & Coordination (WP1):** AIT reviewed the project's overall management framework, ensuring all consortium partners remain tightly aligned and collaborative as the project enters its next phase.
- **Conversion & Insertion Cathode Materials (WP2):** The University of Limerick (UL) shared recent progress on developing more efficient conversion and insertion cathode materials to boost overall energy storage capabilities.
- **Technology Validation & Manufacturability (WP6):** AIT reported on the official launch of this work package, highlighting initial trial results for slurry preparation and component coatings whilst outlining next steps for industrial scaling.
- **Communication, Dissemination and Exploitation (WP8):** F6S presented the communication channels and tools established so far, highlighting the KPIs and mapping out upcoming blog articles, campaigns, and joint partner activities.
- **Magnesium Electrolytes & Separators (WP3):** Karlsruhe Institute of Technology (KIT) outlined recent progress in high-performance electrolyte formulations, additive screening, and the design of sustainable, PFAS-free salts to improve cell stability.
- **Powder Anodes & Protective Coatings (WP4):** Bar-Ilan University (BIU) confirmed that all tasks are on track, focusing on recent developments in spherical powder production and the application of protective thin-film coatings to improve anode safety.
- **Advanced Characterisation (WP5):** Partners analysed how materials perform and degrade under real conditions, with BIU, ZSW, and PSI sharing key results from their respective surface, thermal, and deep electrochemical testing.
- **SSbD, TEA, Manufacturing & Recycling Assessment (WP7):** Imperial College London (ICL) covered progress on aligning EU safety regulations, eco-design frameworks, and hazardous materials screening with the project's production and recycling goals.

Following project updates, the partners participated in a technical workshop to align their complementary technologies and map out the next steps for integration. The day concluded with a tour of the University of Freiburg's laboratory facilities, where UFR Ph.D. students Hendrik Koger and Johannes Thiemann demonstrated ongoing research.

A major advantage of HighMag's approach remains its focus on manufacturability. By designing these magnesium batteries to fit directly into existing lithium-ion production lines, the consortium is actively building a fast track from the lab bench straight to industrial scale.

More about HighMag

- **Project Title:** High-energy, low-cost and scalable generation 5 magnesium-based batteries for mobility applications and beyond
- **Duration:** 2025–2029 (48 months)
- **Coordinator:** AIT Austrian Institute of Technology
- **Funding Programme:** Horizon Europe (HORIZON-CL5-2024-D2-02)

HighMag Consortium Partners

The HighMag project brings together a strong team of experts from leading institutions and companies:

- **AIT Austrian Institute of Technology**, Austria
- **University of Limerick**, Ireland
- **Commissariat a l'Energie Atomique et aux Energies Alternatives**, France
- **Karlsruher Institut fuer Technologie**, Germany
- **Albert-Ludwigs-Universitaet Freiburg**, Germany
- **Amazemet Sp. Z O.O.**, Poland
- **Bar Ilan University**, Israel
- **Zentrum Fur Sonnenenergie- Und Wasserstoff-Forschung Baden-Wuerttemberg**, Germany
- **Danube Cell Manufacturing GmbH**, Austria
- **Imperial College of Science Technology and Medicine**, United Kingdom
- **Lappeenranta-Lahden Teknillinen Yliopisto LUT**, Finland
- **F6S**, Ireland
- **Paul Scherrer Institute**, Switzerland



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