

# Road Mobility

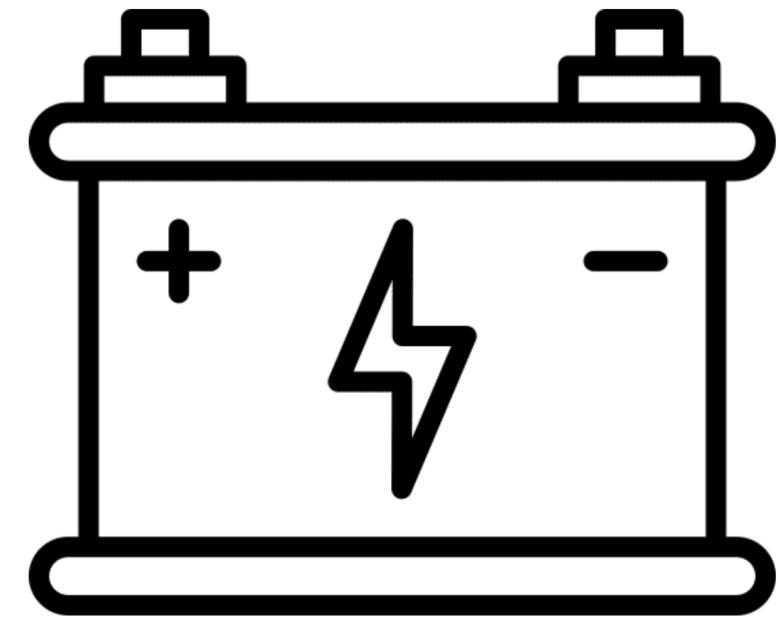
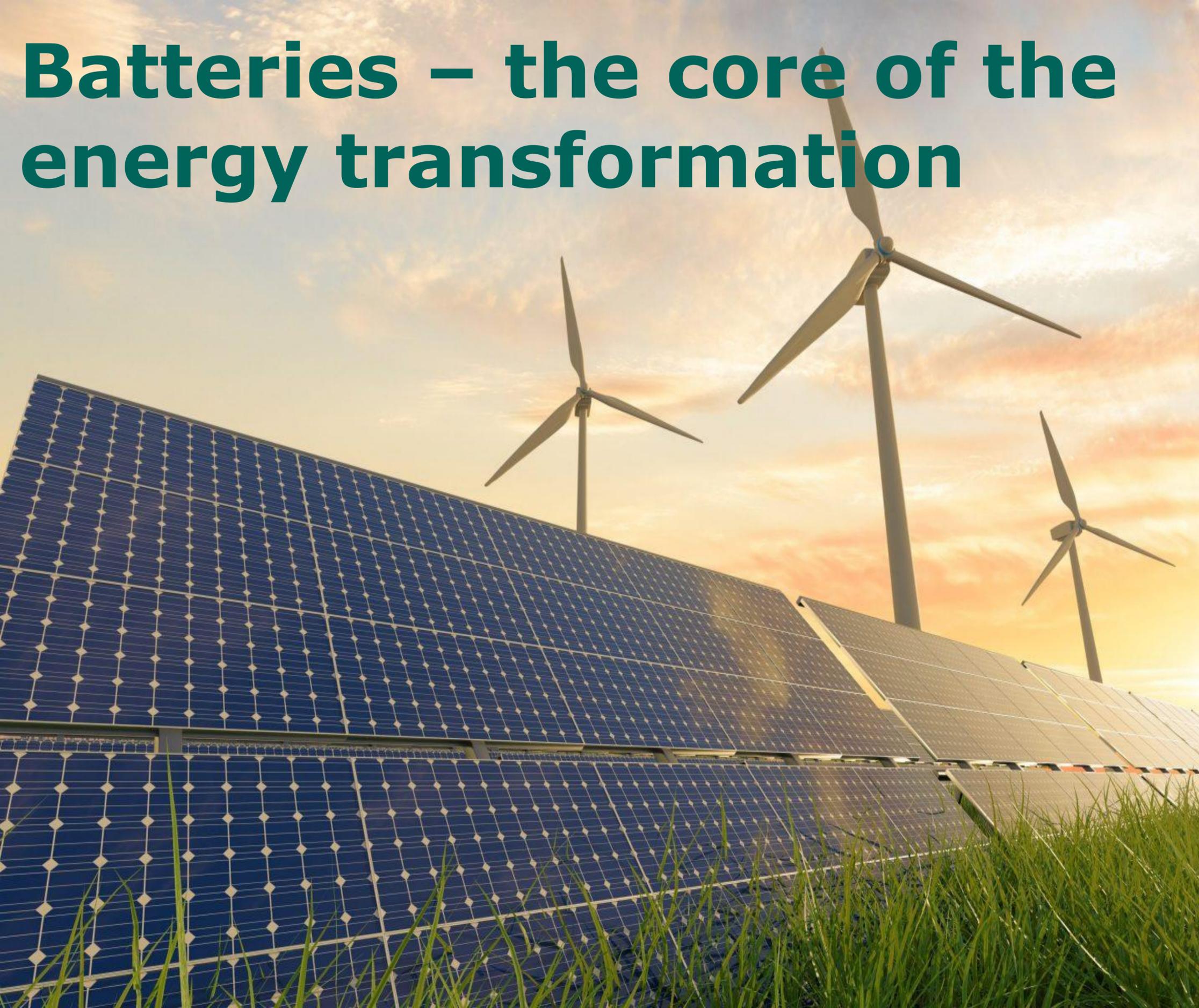
BROKERAGE EVENT

Manufacturing and safety tests of next-generation battery prototypes for e-mobility

Mariusz Walkowiak

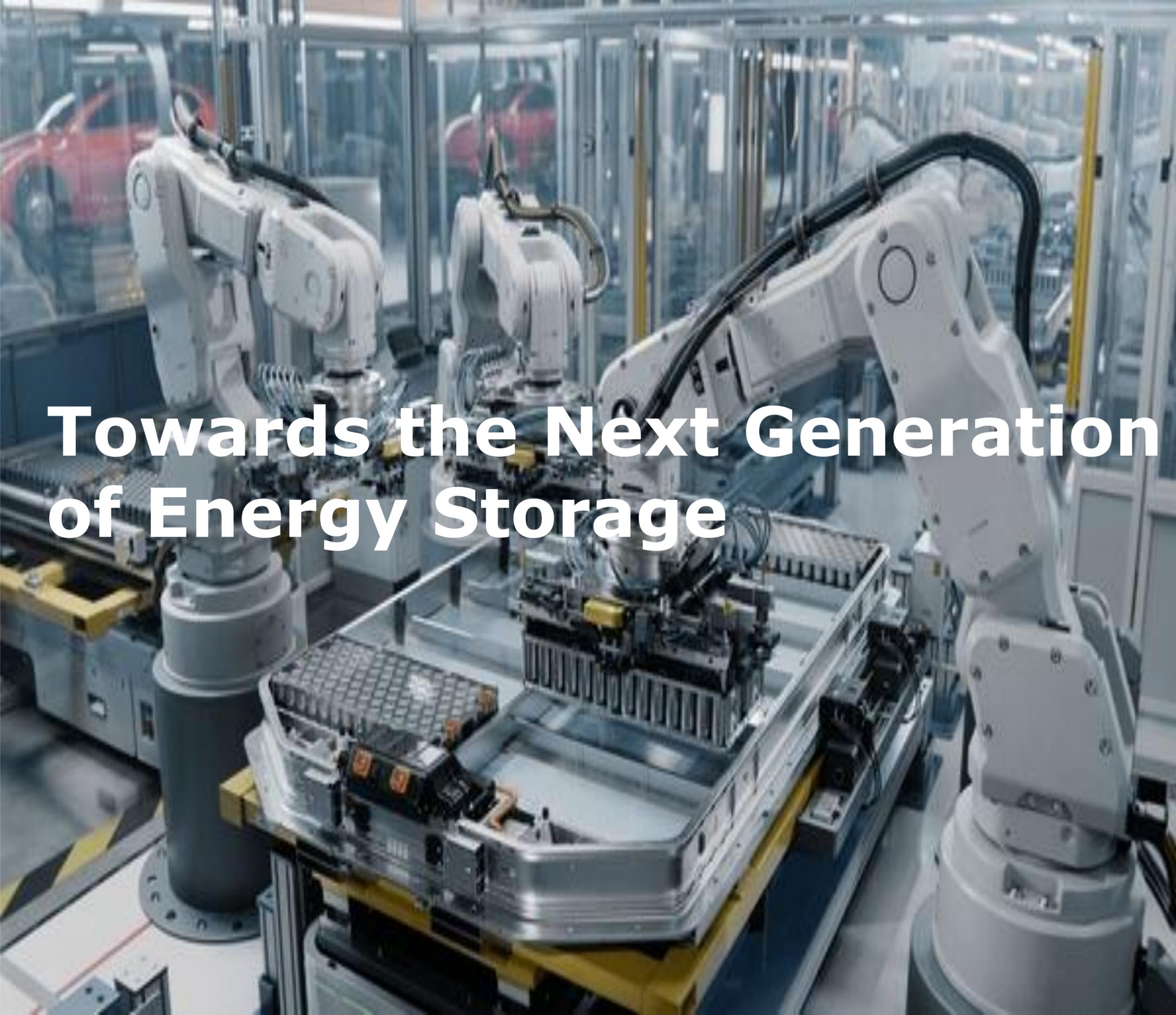


# Batteries – the core of the energy transformation



- **Global battery demand is increasing at an exponential pace, driven by e-mobility and renewable integration**
- **Conventional lithium-based battery chemistries are approaching their theoretical and practical limits**
- **End-users and industries simultaneously demand higher performance, safety, and durability**

# Towards the Next Generation of Energy Storage



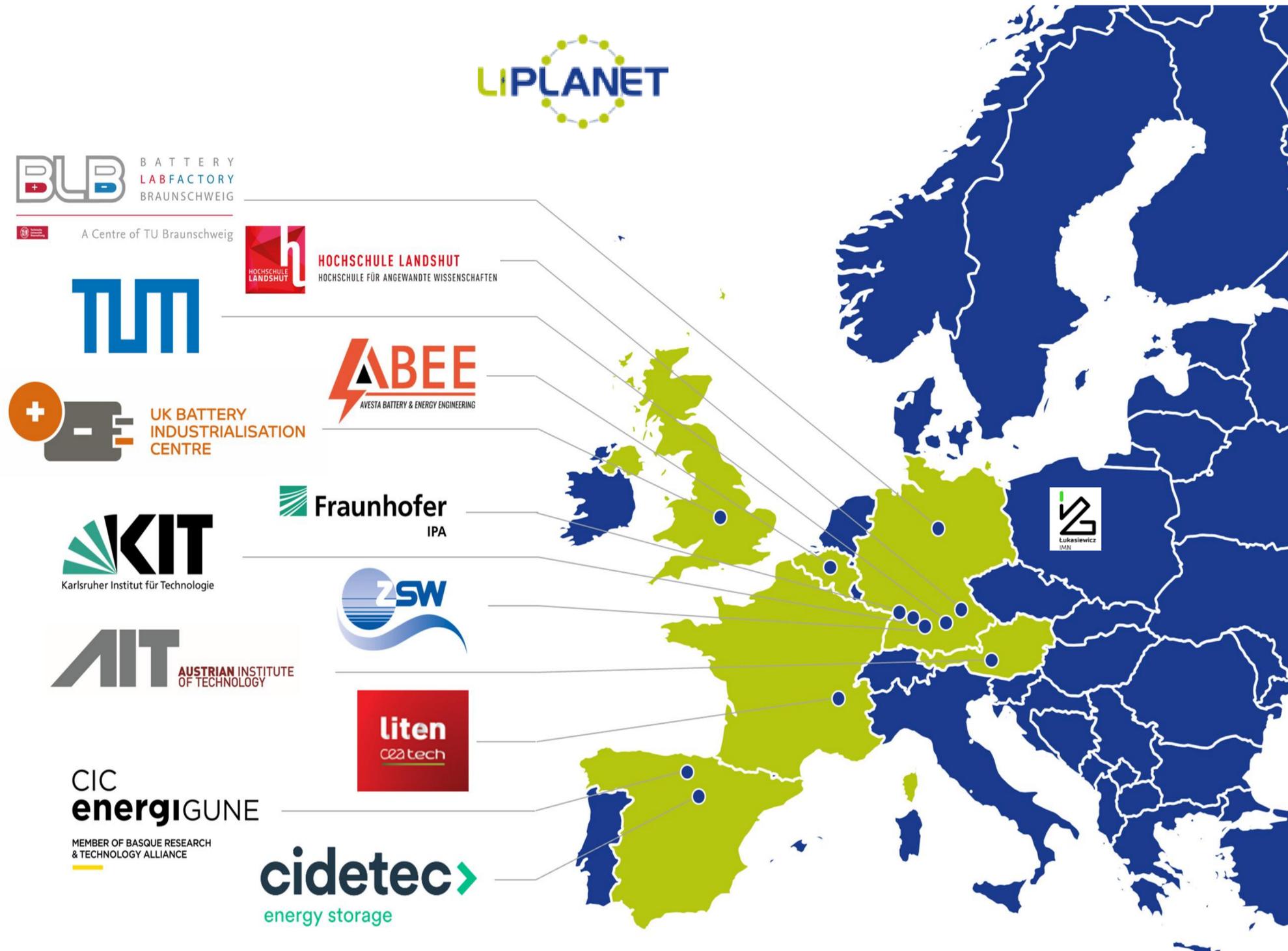
# LITHIUM BATTERY R&D AND PROTOTYPING PILOT LINE

KEY FOR PROGRESS IN BATTERY TECHNOLOGIES

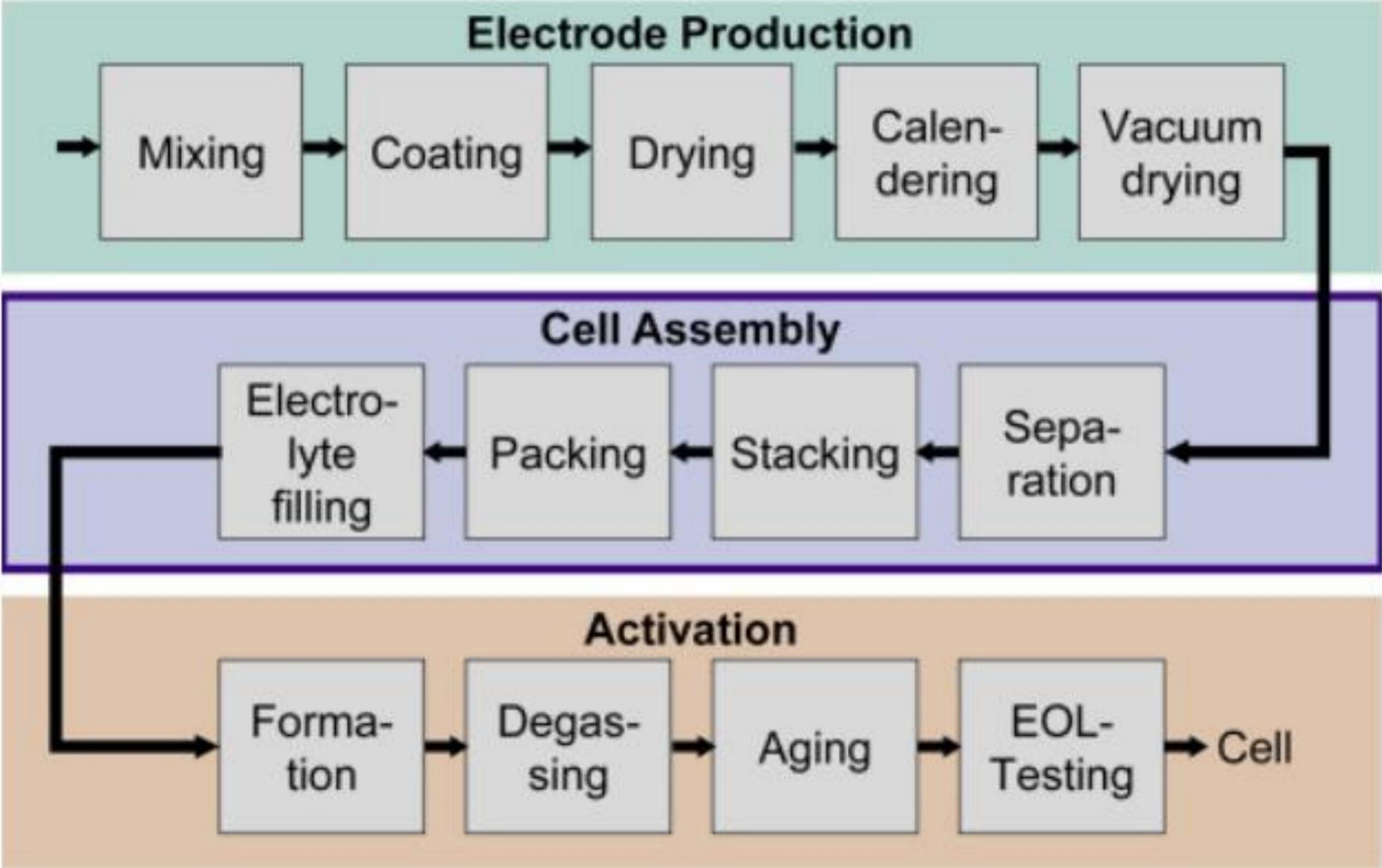
- **From lab to market**  
bridge between scientific discoveries and industrial-scale production
- **Process optimization**  
testing electrode formulations, cell designs, and manufacturing parameters under realistic conditions
- **Quality & safety assurance**  
validating cells before scaling up to gigafactories
- **Strategic autonomy**  
reducing Europe's dependence on imported cell technologies
- **Innovation acceleration**  
enabling rapid iteration of next-generation chemistries (solid-state, Na-ion, LMFP)
- **Collaboration platform**  
connecting research institutes, startups, and industry in a shared R&D ecosystem.



# The new investment at the Poznań division of Łukasiewicz-IMN will be one of the few of its kind in Europe



# Basic cel manufacturing workflow



# WHAT WE OFFER

- ❑ **Design of prototype cells including elaborating the material balance based on basic electrochemical measurements in coin cells**
- ❑ **Optimization of main cell manufacturing processes (coating, calendaring, stack pressing, electrolyte filling, formation)**
- ❑ **Flexible and individual approach to prototype manufacturing for highly innovative and engineered material**
- ❑ **Possibility of working with relatively small quantities of materials**
- ❑ **Full cooperation with the materials' makers/founders**
- ❑ **Possibility of leading separate WP for cell manufacturing combined with comprehensive safety and abuse tests**
- ❑ **Experience in partnering and coordinating international projects**  
**Three ongoing Horizon-Europe projects and two Era-Net-type projects**

# FOR WHOM

## Coordinators of projects seeking partners to cover tasks:

- Testing new battery materials (cathodes, anodes, separators, electrolytes, binders, conducting additives) in a professional, reliable and reproducible pouch cell set-ups as part of the materia validation
- Manufacturing cell models/prototypes as final step of a novel lithium or sodium based technology
- WP and/or tasks leaders for cel prototyping, safety balidation and testing

**HORIZON-CL5-2026-01-D2-01** Development of sustainable and design-to-cost batteries with (energy-)efficient manufacturing processes and based on advanced and safer materials (Batt4EU Partnership)

**HORIZON-CL5-2026-01-D2-04** Integrating advanced materials, cell design and manufacturing development for high-performance batteries aimed at mobility (Batt4EU Partnership)

**HORIZON-CL5-2026-01-D2-05** Accelerated multi-physical and virtual testing for battery aging, reliability, and safety evaluation (Batt4EU Partnership)

**HORIZON-CL5-2026-03-D2-01** Producing battery-grade materials for electrodes through sustainable processing and refining of raw materials or developing bio-based materials (Batt4EU Partnership)

**HORIZON-CL5-2026-03-D2-02** Development of direct recycling processes (Batt4EU Partnership)



# WHO WE ARE

## Łukasiewicz Research Network: 22 Institutes



**Third largest research network in Europe**



**Specialized research equipment**

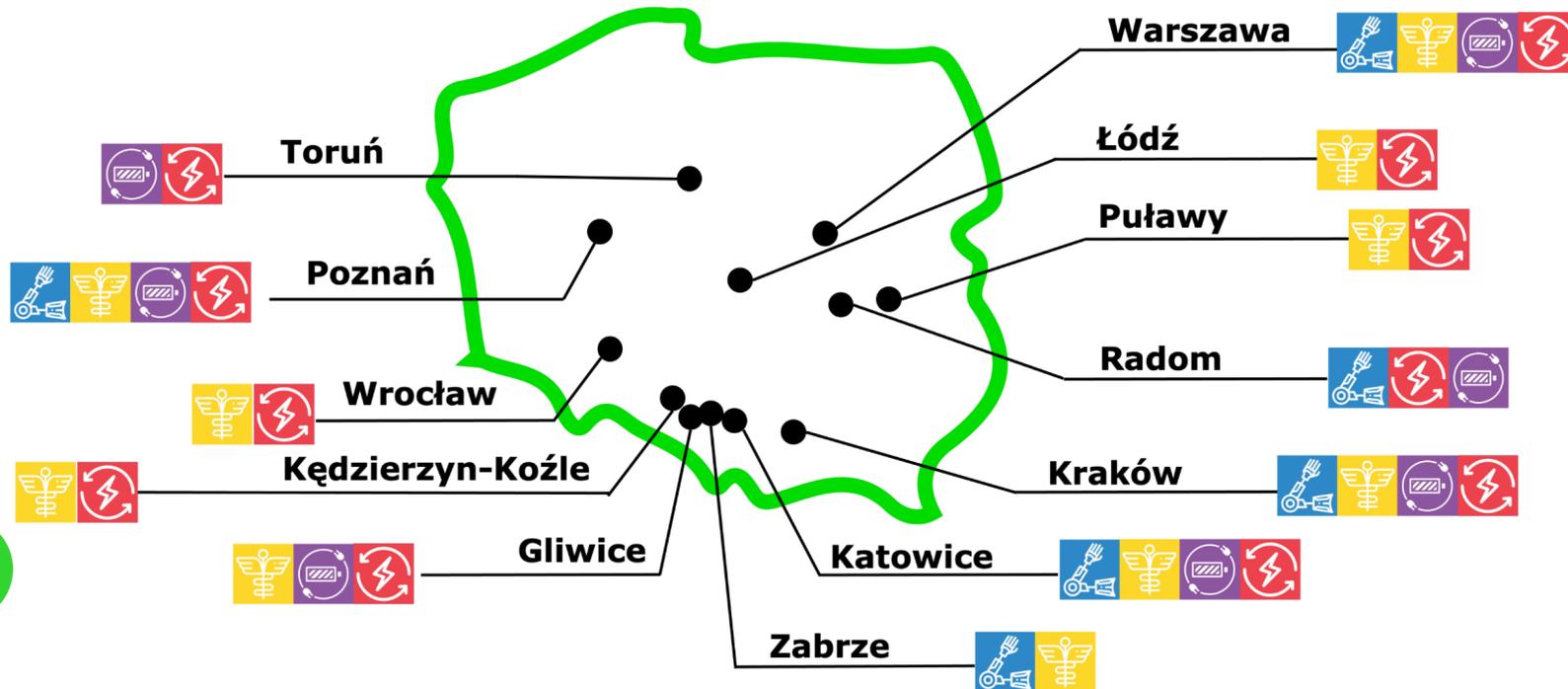
3762 key R&D equipment units, including 497 unique facilities in Poland



**Modern R&D organization**  
Over 440 R&D labs



**The best people work for us**  
Nearly 4500 scientists and technical staff



# Institute of Non-Ferrous Metals

We deliver a wide range of R&D projects – from laboratory scale to pilot scale for all non-ferrous metals, especially for **Cu, Al, Zn, Pb, Ag**, in areas:

- processing of ores and other mineral raw materials, as well as secondary raw materials
- pyrometallurgy
- hydrometallurgy
- scrap and waste processing
- environmental protection
- powder metallurgy
- analytical chemistry
- metal processing
- additive manufacturing (3D printing)
- material engineering – new materials
- chemical power sources and energy storage



# R&D at Poznan division

- Lithium cells, nickel cells, lead-acid batteries, fuel cells, hydrogen cells, PV cells
- Reserve batteries (thermal, ampoule, batteries for rescue purposes)
- Electrochemical capacitors
- New materials and energy storage systems
- New electrochemical systems (Li-S, Mg-ion, Zn-air, Li-air)
- Recycling and circular economy
- Sustainable transport and green energy



# BATTERY TESTING FACILITIES

CRITICAL TO ENSURE SAFETY

- Safety validation
- Performance benchmarking
- Compliance with standards
- Support for innovation
- Trust for the market – ensuring reliability for manufacturers, users, and investors



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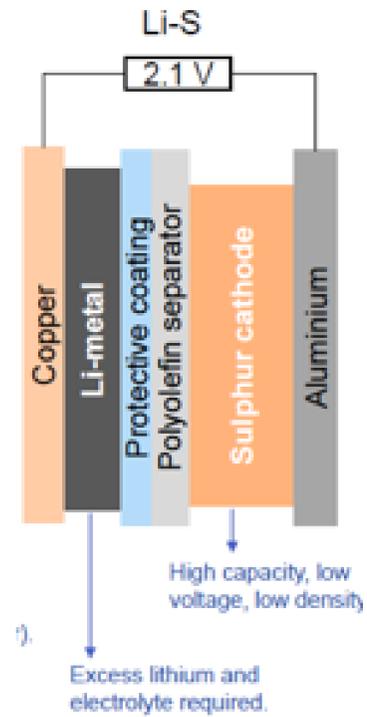


Vibration tester

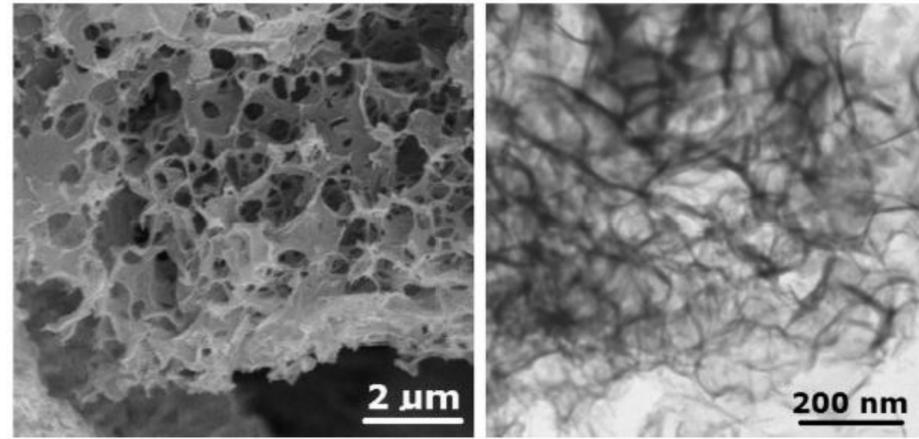
# LITHIUM-SULFUR BATTERY:

## A CASE OF BATTERY R&D AT ŁUKASIEWICZ-IMN

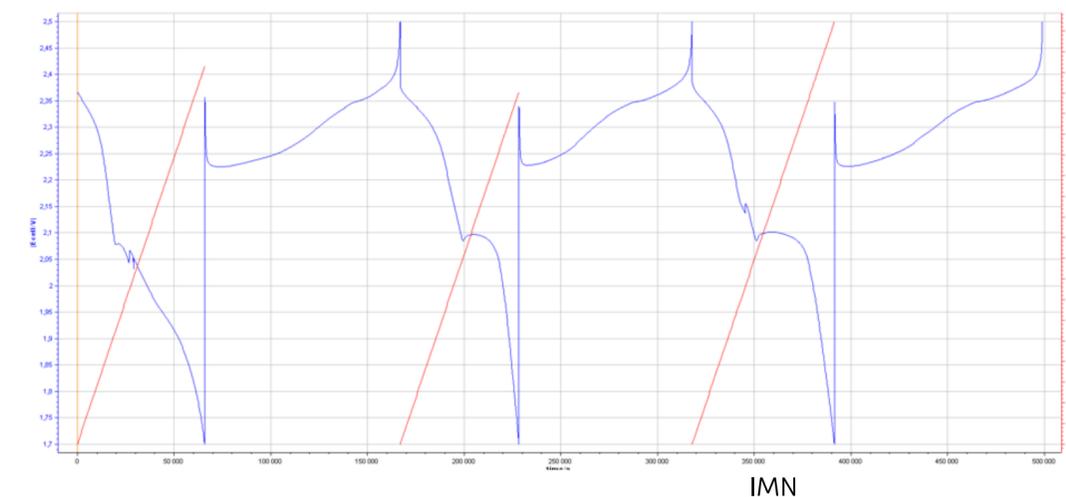
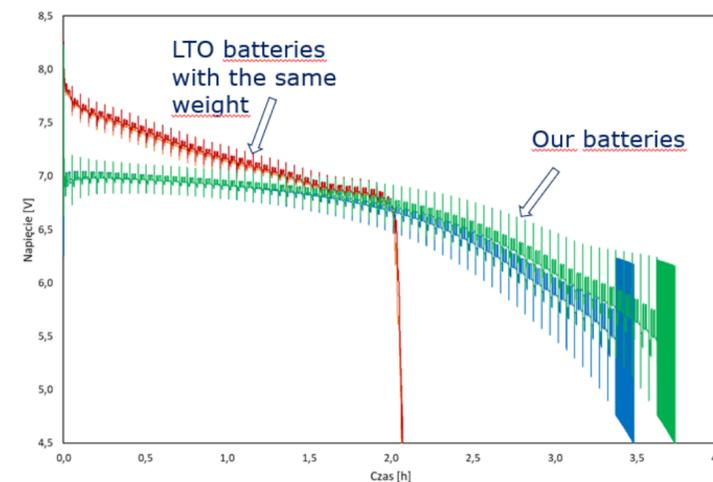
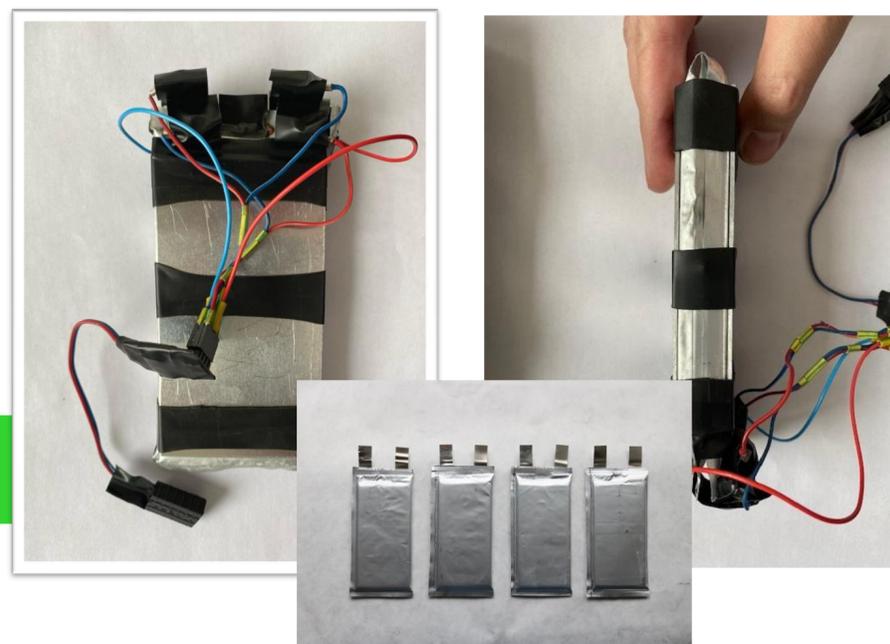
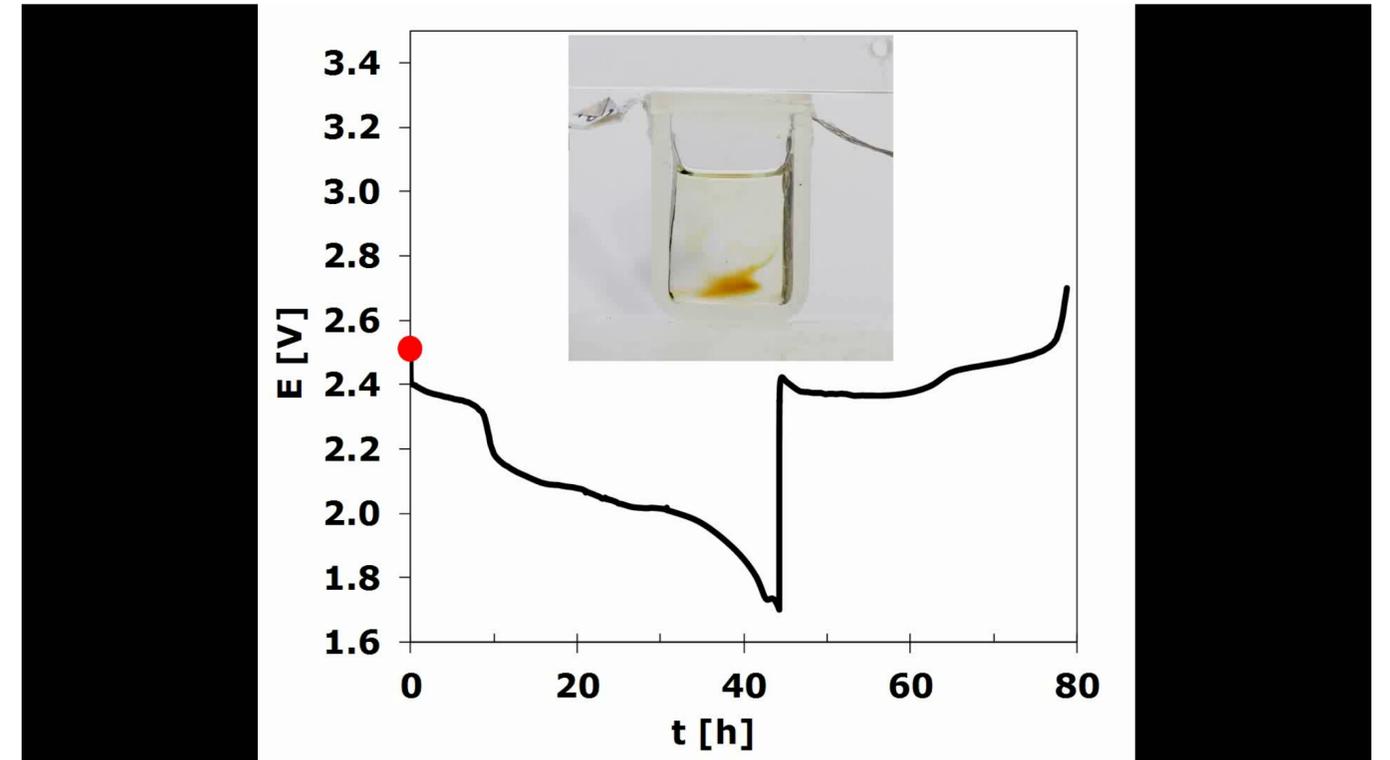
Fundamentally different mechanism as compared to Li-ion



Gen 4 battery concept



Hierarchical carbon obtained from waste PET bottles



# KEY TAKEAWAYS

- ✓ **Lithium/sodium cell pilot line for quick and flexible cel prototype manufacturing for your project**
- ✓ **Comprehensive safety and abuse cel/battery testing for your project**
  
- ✓ **Let's build the future of energy storage together.**

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