

# The Future Will be Driven by Vehicle Electrification

## 14th INTERNATIONAL **aabc** advanced europa automotive europe battery conference

13-16 MAY 2024 | STRASBOURG, FRANCE

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### 2024 CONFERENCE PROGRAMS

PRE-CONFERENCE TUTORIALS: MONDAY 13 MAY

TUESDAY & WEDNESDAY 14-15 MAY



CHEMISTRY - PART 1



ENGINEERING



HEAVY DUTY



MANUFACTURING



RECYCLING

GRID-SCALE

Co-Located Event

WEDNESDAY & THURSDAY 15-16 MAY



CHEMISTRY - PART 2



SAE EV MOBILITY



xEV BATTERY  
TECHNOLOGY



BATTERY INTELLIGENCE



RAW MATERIALS

HYDROGEN  
& FUEL CELLS

Co-Located Event

Join a global audience of battery technologists from leading automotive OEMs and their key suppliers for a must-attend 4 days exploring development trends and breakthrough technologies

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# 2024 CONFERENCE PROGRAMS

PRE-CONFERENCE TUTORIALS: MONDAY 13 MAY

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 BATTERY INTELLIGENCE

**HYDROGEN & FUEL CELLS** Co-Located Event

## TOP REASONS TO ATTEND

- » Learn first-hand about the technical and business directions from major automakers currently active in the European market
- » Hear key global market outlook data on the forecasted consumption trends for China, Japan, Korea, Europe and the United States
- » Meet leading energy storage technologists from all automakers active in the European market
- » Discuss fast-charging solutions coming to the market to support electrification goals for the coming decade
- » Get an in-depth international overview of the lead industry including current trends, competitive analysis and examination of

the key players and their strategies for market growth

- » Discover the latest technological advancements in high specific energy batteries with long cycle life and low cost
- » See how key players are overcoming challenges to commercialization for the specialty EV battery market while assessing consumer demand and competing technologies
- » Understand the many facets of the international battery raw materials market, including advances in mining and processing with an emphasis on sourcing and cost control strategies by manufacturers
- » Network at the largest international gathering of advanced energy storage technology developers and integrators in Europe

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13 MAY 2024 | STRASBOURG, FRANCE

# TUTORIALS\*

\*All Access or separate registration required

MONDAY 13 MAY 14:00-15:30

## TUT1: Solid-State Batteries

Instructor:  
Juergen Janek, PhD, Professor, Solid-State Ionics & Electrochemistry, Justus Liebig University, Giessen

## TUT2: Na-ion Batteries: Materials and State of the Art

Instructor:  
Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin

## TUT3: Sustainability in the Automotive Battery Value Chain

Instructor:  
Stefan Debruyne, Director of External Affairs, SQM International

## TUT4: The Rechargeable Battery Market: Value Chain and Main Trends

Instructors:  
Christophe Pillot, PhD, Director, Avicenne Energy  
Fabrice Renard, Senior Advisor, Avicenne Energy

## TUT5: Cell & Pack Design for xEVs

Instructor:  
Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric

MONDAY 13 MAY 16:00-17:30

## TUT6: Battery Intelligence

Instructor:  
Sheldon Williamson, PhD, Professor & Canada Research Chair, Electrical & Computer & Software Engineering, University of Ontario Institute of Technology

## TUT7: Recycling Methods

Instructor:  
Steve Sloop, PhD, President, OnTo Technology LLC

## TUT8: Improving the Energy Density of Batteries with Silicon-Based Anodes

Instructor:  
Dee Strand, PhD, CSO, R&D, Wildcat Discovery Technologies, Inc.

## TUT9: Battery Safety and Abuse Tolerance Validation

Instructor:  
Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

## TUT10: In-Depth Analysis of the Chinese xEV Battery Market

Instructor:  
Mark H. L. Lu, PhD, Senior Industrial Analyst, Industrial Economics & Knowledge Center, Industrial Technology Research Institute



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14-15 MAY 2024 | STRASBOURG, FRANCE

# LITHIUM BATTERY CHEMISTRY — PART 1

Advancements in Lithium-ion and Beyond

## MONDAY 13 MAY

12:00 Registration Open till 17:00

## TUESDAY 14 MAY

7:00 Registration and Morning Coffee

## MARKET OVERVIEW

### 8:30 Organizer's Remarks

*Victoria Mosolgo, Conference Producer, Cambridge EnerTech*

### 8:35 Chairperson's Remarks

*Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

### 8:40 The Rechargeable Battery Market: Value Chain and Main Trends, 2023-2033

*Christophe Pillot, PhD, Director, Avicenne Energy*

An overview of the 10-year automotive market forecasts from Avicenne and other analysts (micro/Hybrid/P-HEV/EV). Other coverage will include car makers' strategies and advanced energy storage (advanced lead acid/supercap/NiMH/LIB). Additionally, LIB design for P-HEV & EV markets (cylindrical, prismatic, pouch/wounded, stacked, Z fold cells) and LIB cell, module, and pack cost structure will be discussed.

### 9:00 Future Technologies for Automotive Batteries: Opportunities and Challenges

*Angelique Janse van Rensburg, PhD, Head of Cell Chemistry and Methods, BMW Group*

Lithium-ion technology is set to be the workhorse of e-mobility for the next decade and thus demands further R&D to improve the usual performance indicators such as energy density, safety, and lifetime. In addition, more sustainable materials and those that allow for faster charging are of high interest to the automotive industry. Selected observations originating from advanced electrode-active materials are discussed in this presentation.

### 9:20 The Battery Market

*Hauke Simon, PhD, Director Strategy, EY Parthenon*

Battery chemicals have been hailed as a sector with immense growth potential, driven by the increasing demand for batteries in various applications. However, the landscape of the industry has experienced a significant shift especially in Europe. This downturn has prompted a reevaluation of previous growth projections, leading to corrections in forecasts and necessitating a recalibration of strategies for industry stakeholders.

### 9:40 MODERATED Q&A: Session Wrap-Up

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Christophe Pillot, PhD, Director, Avicenne Energy*

*Angelique Janse van Rensburg, PhD, Head of Cell Chemistry and Methods, BMW Group*

*Hauke Simon, PhD, Director Strategy, EY Parthenon*

10:00 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing - Sponsored by ARKEMA

## ELECTROLYTES

### 10:50 The Electrolyte—The Hidden Champion for Maximizing the Performances of Modern and Innovative EV Cells

*Kolja Beltrop, PhD, CTO, E-Lyte Innovations GmbH*

E-Lyte aims to provide a sustainable and resilient supply chain for the perfect electrolyte solution for each energy storage system. The automotive industry currently has the greatest need for safe and powerful energy storage systems. The presentation will answer the question of why it is so difficult to find the

perfect electrolyte for commercial battery technologies used in electric vehicles and how E-Lyte overcomes this challenge.

### 11:10 Enabling Lithium Metal: From Mine to Materials, Batteries, Vehicles, and Data

*Kang Xu, PhD, MRS Fellow, ECS Fellow, ARL Fellow (emeritus), Chief Scientist, SES AI Corp*

SES AI specializes in rechargeable Li-Metal batteries (LMBs) with advanced electrolyte systems. These batteries offer excellent cycle-life, rate capability, energy density, and safety. SES has commercialized 100 Ah large format LMBs for EV and eVTOL applications. The company is now leveraging AI/ML for data mining in materials discovery, electrochemistry design, battery integration, recycling, and database management.

### 11:30 Presentation to be Announced

Armarator is a proprietary-design separator that offers a number of advantages over conventional separators including high temperature integrity, low film impedance and it does not require modifications to existing production processes. Armarator is easy for seamless adoption as a cost-effective solution for battery manufacturers.



### 11:50 MODERATED Q&A: Session Wrap-Up

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Kolja Beltrop, PhD, CTO, E-Lyte Innovations GmbH*

*Kang Xu, PhD, MRS Fellow, ECS Fellow, ARL Fellow (emeritus), Chief Scientist, SES AI Corp*

12:10 Networking Lunch (Sponsorship Opportunity Available)

13:10 Dessert Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## CATHODES

### 13:40 Chairperson's Remarks

*Egbert Figgemeier, PhD, Senior Manager, IEK 12, Helmholtz Institute Muenster*

### 13:45 Cathode Research

*Xin Xia, Director, Global Technical Sales, Battery Materials, BASF*

This talk will explore BASF's latest cathode research developments, with focus on chemistry and material advancements.

### 14:05 Pre-Lithiation as Enabling Technology for High-Capacity Negative Electrodes

*Egbert Figgemeier, PhD, Senior Manager, IEK 12, Helmholtz Institute Muenster*

Replacing carbon-based materials with silicon in negative electrodes for lithium-ion-batteries promises a boost of capacity and is therefore a major R&D topic. Nevertheless, widespread commercial automotive applications with silicon-modified anodes are still at the horizon, but not a commercial fact. Issues regarding volume variations, particle disintegration, and electrolyte consumption are hurdles still to overcome. The presentation will summarize latest efforts and prospects with regard to commercialization of silicon-based anodes.

### 14:25 Wildcat U.S. Manufacturing Plans for Advanced Cathode Materials

*Dee Strand, PhD, CSO, R&D, Wildcat Discovery Technologies, Inc.*

The intersection of Wildcat Discovery Technologies' materials experience with the U.S. goal of a domestic supply chain provides a unique opportunity. We will describe Wildcat's plan and progress to manufacture advanced cathode materials. Our product pipeline consists of materials that 1) provide a range of energy densities; 2) are free of cobalt and nickel; 3) show promising material safety performance; and 4) have synergies in manufacturing unit operations.



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# LITHIUM BATTERY CHEMISTRY — PART 1

Advancements in Lithium-ion and Beyond

## 14:45 MODERATED Q&A: Session Wrap-Up

Moderator: Egbert Figgemeier, PhD, Senior Manager, IEK 12, Helmholtz Institute Muenster

Panelists:

Xin Xia, Director, Global Technical Sales, Battery Materials, BASF

## 15:05 Refreshment Break in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

## 15:30 Electrode and Cell Design for Sulfide Electrolyte-Based Solid-State Batteries

Holger Althues, PhD, Head, Chemical Surface Technology Group, Fraunhofer Institute for Material & Beam Technology

The talk will present and discuss innovations in electrode and cell design for sulfide electrolyte-based solid-state batteries. 100% silicon anodes were applied as stable high-energy anode concept in single- and multi-layer pouch cells with dry-processed NMC composite cathodes and solid electrolyte membranes. The cycling performance was studied in dependence of temperature and external pressure revealing high rate capability and cycle life.

## 15:50 Novel Electrolyte Additives for Enabling High Energy Lithium-ion Chemistries

Gabriel Torres, Director of Product Management, Sionic Energy

Next-gen lithium-ion batteries feature high-nickel NMC cathodes paired with silicon anodes to boost energy density, demanding innovative electrolyte design for safety, cycle life, and power considerations. Achieving control over the electrode-electrolyte interface, especially for new materials, involves employing sacrificial additives. Presented are novel electrolyte additives designed for high-energy cathodes and silicon anodes, focusing on stabilizing the CEI and SEI in this system.

## 16:10 Battery aging mechanism analysis and pre-failure warning application of ripple

Johannes Roessner, CEO - BT Advisor, Xi'an Stropower Technologies Co., Ltd.

Most studies on battery aging mechanism only consider DC factors but rarely complex ripples in vehicle. With systematically studied aging mechanism of the batteries caused by ripple, so to use the spectrum characteristics to monitor SOH, lithium plating and else back to time domain.

## 16:30 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

Moderator: Egbert Figgemeier, PhD, Senior Manager, IEK 12, Helmholtz Institute Muenster

Panelists:

Holger Althues, PhD, Head, Chemical Surface Technology Group, Fraunhofer Institute for Material & Beam Technology

Gabriel Torres, Director of Product Management, Sionic Energy

Johannes Roessner, CEO - BT Advisor, Xi'an Stropower Technologies Co., Ltd.

## 16:50 Networking Reception in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

## 18:00 Close of Day

### WEDNESDAY 15 MAY

## 7:20 Registration Open

## 7:30 Interactive Breakout Discussions & Morning Coffee

Interactive Breakout Discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

### TABLE 1: Solid State Batteries

Moderator: Venkataraman Thangadurai, PhD, Professor, Chemistry, University of Calgary

### TABLE 2: Electrolytes

Moderator: Gabriel Torres, Director of Product Management, Sionic Energy

### TABLE 3: Innovations in Recycling Battery Materials & Second Life

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Moderator: Steve Sloop, PhD, President, OnTo Technology LLC

### TABLE 4: Li-ion NMC Fast Charging New Cells for E-Mobility

Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

### TABLE 5: Battery Raw Materials Supply Chain

Moderator: Tom Van Bellinghen, Vice President, Marketing & OEM Value Chain, Rechargeable Battery Materials, Umicore

### TABLE 6: Benefits of Wireless Communication Technology in Battery Management Systems

Moderator: Stefan Goede, Head of Research & Development, Co-Founder, Munich Electrification GmbH

### TABLE 7: Opportunities and Potential for New Battery Technologies

Moderator: Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH

### TABLE 8: Silicon Anodes and Cells

Moderator: Benjamin Park, PhD, Founder & CTO, Enevate

### TABLE 9: Battery Intelligence

Moderator: Eli Leland, PhD, CTO and Co-Founder, Voltaiq, Inc.

### TABLE 10: Cell Engineering

Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH

### TABLE 11: Advances in Sodium-ion Battery Materials

Moderator: Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin

## 8:20 Organizer's Remarks

Victoria Mosolgo, Conference Producer, Cambridge EnerTech

## 8:25 Chairperson's Remarks

Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster

## LITHIUM-SULFUR

### 8:30 Lyten is Making Li-S Batteries a Commercial Reality

Karel Vanheusden, PhD, Vice President, Product Development, Lyten, Inc

Lyten is commercializing lithium-sulfur batteries enhanced with its proprietary 3D Graphene to enable next generation energy-storage with higher energy density, shorter charging times and longer cycle life. Lyten started operating a 3 MWh Li-S battery pilot line in California to support a variety of customers, and to further develop manufacturing capabilities for GWh-scale materials and cell production.

## 8:50 Presentation to be Announced



## SILICON ANODE

### 9:10 Umicore's Silicon Anode Material—How to Answer the Key Requirements from Electric Vehicle Manufacturers?

Stephane Levasseur, PhD, Senior Director Innovation Battery, Umicore

After 15 years of R&D, Umicore introduces its silicon carbon composite (Si/C) anode portfolio. Today, and after extensive testing at large-scale, our customers confirm that Umicore Si/C technology is the right answer to meet their key requirements for next-generation EV batteries: performance, cost, scalability, ESG, and IP. We will detail our go-to-market strategy and industrial plan to be the first European Si-anode player at-scale.

### 9:30 On the Way to Silicon-Based Anode Materials—Beyond Cycle Stability

Stefan Haufe, PhD, Director, LIB Application Technology, R&D, Wacker Chemie AG

The challenges related to the huge volume change of silicon during lithiation still hamper its use as main anode material in lithium-ion batteries. Material concepts, addressing both mitigation on the electrode as well as on the materials level, are under investigation. Besides cycle stability and further electrochemical properties, applicability in existing production equipment and economic attractiveness are in the focus of these developments.



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# LITHIUM BATTERY CHEMISTRY — PART 1

Advancements in Lithium-ion and Beyond

## 9:50 LFP Battery Cells Made in Europe—A Matter of Course in the Future or Not Feasible? Opportunities and Challenges of a Domestic LFP Supply Chain

*Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH*

LFP-based battery cells see increasing popularity in the e-mobility market promising a safe and cost effective solution. To decrease dependency on Chinese import, more LFP cell capacities are planned to be installed in Europe—but can the technology keep its low-cost footprint in a western environment? This question is answered by analyzing the impact of local manufacturing conditions on the LFP cell cost structure.

## 10:10 Presentation to be Announced



## 10:30 PANEL DISCUSSION: MODERATED Q&A:

### Session Wrap-Up

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Karel Vanheusden, PhD, Vice President, Product Development, Lyten, Inc*

*Stefan Haufe, PhD, Director, LIB Application Technology, R&D, Wacker Chemie AG*

*Stephane Levasseur, PhD, Senior Director Innovation Battery, Umicore*

*Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH*

## 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## 11:20 Binders vs. Structural Additives—The Key to Maximum Silicon Anode Performance

*Manuel Wieser, CTO, AnteoTech Ltd.*

Binders and additives, though a small part of anode compositions, play a crucial role in achieving a long cycle life. This is especially vital for silicon-containing anodes, where materials like SiO<sub>x</sub>, Si/C, or Si are employed to enhance storage capacity. Evolving binder chemistries and innovative structural additives, such as Anteo X, aim to minimize inactive materials, pushing silicon anodes forward with significant cycle improvements.

## 11:40 Na-ion Batteries: Materials and State-of-the-Art

*Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin*

Na-ion batteries (SIBs) are emerging as potential alternatives to complement Li-ion battery (LIB) technology. SIBs offer energy densities close to LIBs while reducing the use of critical elements. Their conceptual similarity allows for production on existing LIB manufacturing lines, facilitating market implementation. This talk provides an overview of Na-ion battery development, focusing on materials (anode, cathode) and electrolytes.

## 12:00 Presentation to be Announced



Discover the impact of removing fluorinated binders and NMP solvent. Neocarbonix technology eliminates these materials from the battery, overcoming major blockers at each stage of its lifecycle, while leveraging conventional roll-to-roll coating equipment. This innovation streamlines manufacturing and recycling while enhancing the driving experience. Neocarbonix enables a 35% increase in energy density, a 27% cost reduction, and a 25% reduction in carbon footprint.

## 12:20 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Manuel Wieser, CTO, AnteoTech Ltd.*

## 12:40 Networking Lunch *(Sponsorship Opportunity Available)*

## 14:00 Dessert Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## 14:30 Close of Conference



14-15 MAY 2024 | STRASBOURG, FRANCE

# EV TECHNOLOGY FOR HEAVY DUTY APPLICATIONS

Commercialising Advanced High-Energy Batteries and Infrastructure for HEVs

## MONDAY 13 MAY

12:00 Registration Open till 17:00

## TUESDAY 14 MAY

7:00 Registration and Morning Coffee

### HEAVY-DUTY MARKET EXPANSION

#### 8:30 Organizer's Remarks

*Craig Wohlers, Executive Director, Conferences, Cambridge EnerTech*

#### 8:35 Chairperson's Remarks

*Denis Gorman, Head of Batteries & High Voltage Systems, FutureMotiv*

#### 8:40 Cell Safety for Commercial Vehicles

*Dragoljub Vrankovic, PhD, Manager, Team Cell Technology, Daimler Truck*

Battery electric trucks can be the future backbone of the transport industry—combining maximum energy efficiency with good flexibility. Daimler Truck AG has proven, with a number of projects and products on a global scale, how capable these electric trucks can be. This presentation will investigate the special needs of batteries and cells for commercial vehicles with a special focus on cell chemistry and safety.

#### 9:00 Battery Cathode Chemistries for Heavy Duty On-Highway Trucks

*John Forgie, PhD, Electrochemistry Senior Manager, Accelera by Cummins*

Heavy duty truck OEMs have shown mixed interest in their cathode selection for BEV. In North America and Europe, companies leveraging their passenger car battery development have chosen layered-oxide cathodes, whereas others have chosen phosphate technology. China boasts the highest use of heavy truck BEV's, with phosphate technology being the predominant choice. At Accelera, we are investigating both technologies. Advantages, disadvantages, and the roadmaps of these chemistries will be discussed.

#### 9:20 Battery Powered Trains: Operation of Li-ion Batteries and Effect of High-Switching Frequencies from DC/DC Converters

*Tony Jaumann, PhD, Senior Specialist for Energy Storage Systems, Power Transmission - System Development, Siemens Mobility*

Battery Powered Trains (BEMU) will continuously substitute diesel trains (DMU) in catenary-free rail network. Siemens Mobility will present results for aging and operation of Li-ion batteries with up to 1000 V. Charging of BEMU is carried out at overhead lines. Focus of the study will be the influence of ripple currents on battery cells as a result of DC/DC converters and 15 kV AC overhead lines.

#### 9:40 MODERATED Q&A: Session Wrap-Up

*Moderator: Denis Gorman, Head of Batteries & High Voltage Systems, FutureMotiv*

*Panelists:*

*Dragoljub Vrankovic, PhD, Manager, Team Cell Technology, Daimler Truck*

*John Forgie, PhD, Electrochemistry Senior Manager, Accelera by Cummins*

*Tony Jaumann, PhD, Senior Specialist for Energy Storage Systems, Power Transmission - System Development, Siemens Mobility*

#### 10:00 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing - Sponsored by ARKEMA

#### 10:50 Battery Technologies for Multiple Units - Accelerating the Electrification of the Railway

*Ezequiel Glasserman, Battery System Engineer, Stadler Deutschland GmbH*

Battery electrical multiple units, such as the Stadler FLIRT Akku, offer a hybrid solution to rapidly electrify train lines still running on fossil fuels. The demands on the reliability and quality of multiple units, which are in use almost around the clock for up to 30 years, place high demands on the battery system. Here we present the first series-produced battery electrical multiple unit in Germany.

### INNOVATION IN HEAVY-DUTY APPLICATIONS

#### 11:10 Extreme Fast-Charge Batteries for Heavy-Duty Applications

*Brian Barnett, PhD, CTO, Nyobolt*

For many heavy-duty applications, batteries must deliver very high-power discharge capability and a very large number of charge-discharge cycles. The IDEAL battery would provide these attributes and would also be capable of incredibly fast charge with minimal heat release, allowing almost constant up-time. Nyobolt is commercializing battery technology with the capability of fully charging in 5-10 minutes or less, with outstanding cycle life, for mining and material handling/robotic applications.

#### 11:30 Presentation to be Announced



#### 11:50 MODERATED Q&A: Session Wrap-Up

*Moderator: Denis Gorman, Head of Batteries & High Voltage Systems, FutureMotiv*

*Panelists:*

*Ezequiel Glasserman, Battery System Engineer, Stadler Deutschland GmbH*

*Brian Barnett, PhD, CTO, Nyobolt*

#### 12:10 Networking Lunch (Sponsorship Opportunity Available)

#### 13:10 Dessert Break in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

### INNOVATION IN HEAVY-DUTY APPLICATIONS

#### 13:40 Chairperson's Remarks

*Tony Jaumann, PhD, Senior Specialist for Energy Storage Systems, Power Transmission - System Development, Siemens Mobility*

#### 13:45 Powertrain Sizing for Heavy-Goods FCEVs

*Denis Gorman, Head of Batteries & High Voltage Systems, FutureMotiv*

Fuel cell vehicles are expected to be a key contributor to decarbonizing transportation, particularly for heavy goods and off-highway applications. A holistic approach to system sizing can minimize cost, weight, and complexity, all whilst ensuring that vehicle capability is not compromised. This session will demonstrate how customer requirements can be used to select appropriately-sized components, and explore how the capabilities of those components are interdependent.

#### 14:05 Fast-Charging in High-Utilization Use Cases: Optimization of Power/Energy Ratios

*Linda Marie Ormus, Business Development Manager, Skeleton Technologies*

The electrification of high utilization use cases requires low charging times and long cycle lifetimes in order to ensure low total cost of ownership. Skeleton Technologies has developed a high-power energy storage technology capable of being charged in 60 seconds and surviving up to 50,000 cycles. This presentation will analyze the requirements of high utilization use cases and how different energy storage technologies provide the lowest TCO for these applications.

#### 14:25 Hybrid Supercapacitors with Lithium-ion Batteries in Electric Vehicles for Fast-Charging

*Kawinkorn lamrod, PhD, Researcher, University of Birmingham; Researcher, The Faraday Institution*

This study aims to scale down supercapacitors to a coin cell size. Various charging rates will be applied to these cells using the VMP3 potential state from BioLogic. This experimentation will simulate scenarios where supercapacitors assist batteries in rapid charging from high-rate charger devices and when they harvest excess energy from the driving system with slower charging rates.



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Panelists:

Denis Gorman, Head of Batteries & High Voltage Systems, FutureMotiv  
Linda Marie Ormus, Business Development Manager, Skeleton Technologies  
Kawinkorn Iamrod, PhD, Researcher, University of Birmingham; Researcher, The Faraday Institution

## 15:05 Refreshment Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## 15:30 Operation Optimization of Heavy-Duty Vehicles Based on Updated Battery Degradation Models

Josu Olmos, Researcher, Ikerlan Technology Research Centre

Data-driven battery degradation models increase the confidence of their predictions as more data is compiled from operation. Each time the degradation model is updated, the operation of a fleet of heavy-duty vehicles can be re-optimized (e.g., updating the charging or energy management strategy), so the warranty period of the battery is respected. As new vehicles are introduced in the fleet, transfer learning is applied to develop new degradation models.

## 15:50 Recycled NCM Cathode-Active Material Engineered for High-Power, High-Performance Heavy-Duty Lithium-ion Battery Applications

Ian Braime, Chief Commercial Officer, Ascend Elements

Kevin Dahlberg, PhD, Vice President of Cell Technology, Freudenberg e-Power Systems

Ascend Elements and Freudenberg e-Power Systems have collaborated to develop a novel recycled NCM-grade material tailored for heavy duty electrification applications, enabling long cycle life, high charge rate, and high safety. Recently both companies have worked together to scale and demonstrate the material and corresponding cell performance in multilayer 2 Ah prototype pouch cells and in large format production scale pouch cells.

## 16:10 Sponsored Presentation (Opportunity Available)

## 16:30 MODERATED Q&A: Session Wrap-Up

Moderator: Tony Jaumann, PhD, Senior Specialist for Energy Storage Systems, Power Transmission - System Development, Siemens Mobility

Panelists:

Josu Olmos, Researcher, Ikerlan Technology Research Centre  
Ian Braime, Chief Commercial Officer, Ascend Elements  
Kevin Dahlberg, PhD, Vice President of Cell Technology, Freudenberg e-Power Systems

## 16:50 Networking Reception in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## 18:00 Close of Day

## WEDNESDAY 15 MAY

## 7:20 Registration Open

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### TABLE 9: Battery Intelligence

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### TABLE 10: Cell Engineering

Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH

### TABLE 11: Advances in Sodium-ion Battery Materials

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## INNOVATION IN HEAVY-DUTY APPLICATIONS

### 8:45 Chairperson's Remarks

Ezequiel Glasserman, Battery System Engineer, Stadler Deutschland GmbH

### 8:50 1000km+ zero emission: GenH2 Fuel Cell Truck's High Performance Battery

Kristina Pfeifer, PhD, R&D Engineer, Product Engineering, Daimler Truck AG

The Mercedes-Benz Trucks GenH2 Fuel Cell Truck recently made headlines for completing a remarkable journey, covering a record-breaking 1047 km on just one hydrogen tank. This success is attributed to an efficient system design, particularly the high-voltage battery and other essential components. The talk gives an overview of the overall GenH2 truck system with a special focus on its battery design and highlights the differences to battery-electric trucks.

### 9:10 Myth-Busting Heavy-Duty Electrification

Sigve Aasebo, Senior Advisor, Statens Vegvesen

Heavy-duty electrification is dependent on lighter, higher C, and cheaper battery cells. There will be no change before the vehicles may charge on publicly-available fast chargers. Business and logistics chains will remain, and the same transport companies will transition into a carbon neutral transport economy. Or is it the other way around? Join for an analysis made to make you think.

### 9:30 Advanced Concept of an Algorithm Extending the Life of Batteries in Electric Buses by Dynamically Adjusting the Depth of Discharge of Lithium-ion Cells

Bartek Kras, PhD, VP & CTO, Impact Clean Power Technology SA

Limiting the depth of discharge (DOD) allows you to achieve a greater number of cycles, but limits the useful energy in one cycle. The publication examined the hypothesis that it is possible to extend the lifetime and increase the discharge energy (higher vehicle mileage) at the expense of an initial limitation of the discharge depth (shorter range at the beginning of use).

## ADVANCES IN SAFETY FOR HEAVY-DUTY APPLICATIONS

### 9:50 First Responder Emergency Response Guide Considerations for HVOR Applications

Brian Engle, Manager, Business Development, Electrification, Amphenol

The SAE J2990 Task Force has developed standard practice for documenting Emergency Response Guides for EV and fuel cell vehicles. Field incident investigations, first responder feedback, and recent research has provided



further guidance for tools and resources needed as battery systems scale up for HVOR markets.

### 10:10 How to Improve Operations of Mass Transport Vehicles with Predictive Battery Analytics



*Sebastian Kawollek, Director Products & Projects, ACCURE Battery Intelligence*

This presentation delves into advanced battery analytics techniques to enhance the efficiency, reliability, and lifespan of batteries in heavy-duty electric vehicles. Dr. Sebastian Kawollek, Director Product & Projects at ACCURE, will share the latest advancements in big data, machine learning, AI, and predictive analytics. Using real-world examples he'll demonstrate how fleets are using cloud-based analytics to better manage risk and enhance battery performance.

### 10:30 MODERATED Q&A: Session Wrap-Up

*Moderator: Ezequiel Glasserman, Battery System Engineer, Stadler Deutschland GmbH*

*Panelists:*

*Kristina Pfeifer, PhD, R&D Engineer, Product Engineering, Daimler Truck AG*

*Sigve Aasebo, Senior Advisor, Statens Vegvesen*

*Bartek Kras, PhD, VP & CTO, Impact Clean Power Technology SA*

*Brian Engle, Manager, Business Development, Electrification, Amphenol*

### 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

### 11:20 Advances on High-Safety and Long-Lasting Lithium-ion Batteries for Demanding Heavy-Duty Applications

*Khadija Yazda, PhD, Product Manager, High Voltage Battery Systems, Engineering, ElectroVaya*

Electrovaya's infinity batteries provide superior performance over conventional lithium-ion battery solutions, and are exceptionally well-suited for demanding and mission-critical applications where longevity and fire safety are critical metrics. This superior performance was achieved through years of R&D, extending the battery's lifetime and setting the industry standards (End of Life ~14000 cycles, equivalent to 3.5 million mile for a 250-mile range).

### 11:40 Benefits of Deploying Electrical Impedance Spectrometry (EIS)

*Clemens Vanzeyl, Founder and Managing Director, Heimdalytys GmbH*

While lithium-ion batteries are prevalent in our lives, they are made safe through the encasement of the battery, combined with temperature sensing and cycle counting. This strategy is effective for electronics and small mobile applications, but impractical for large systems. Large systems require accurate measurement of a battery's "state of health," so that it may be isolated and replaced before failing.

### 12:00 Sponsored Presentation *(Opportunity Available)*

### 12:20 MODERATED Q&A: Session Wrap-Up

*Moderator: Ezequiel Glasserman, Battery System Engineer, Stadler Deutschland GmbH*

*Panelists:*

*Khadija Yazda, PhD, Product Manager, High Voltage Battery Systems, Engineering, ElectroVaya*

*Clemens Vanzeyl, Founder and Managing Director, Heimdalytys GmbH*

### 12:40 Networking Lunch *(Sponsorship Opportunity Available)*

### 14:00 Dessert Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

### 14:30 Close of Conference



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# BATTERY RECYCLING

Advanced Recycling Methods for Sustainable Battery Materials Supply

## MONDAY 13 MAY

12:00 Registration Open till 17:00

## TUESDAY 14 MAY

7:00 Registration and Morning Coffee

### EXPANDING GLOBAL RECYCLING MARKETS

#### 8:30 Organizer's Remarks

*Craig Wohlers, Executive Director, Conferences, Cambridge EnerTech*

#### 8:35 Chairperson's Remarks

*Steve Sloop, PhD, President, OnTo Technology LLC*

#### 8:40 Future Scenarios for LIB Recycling in Each Region (Europe/US/China/Japan)

*Akihito Fujita, Co-Head, Research & Consulting, Nomura Research Institute America, Inc.*

#### 9:00 Battery Recycling and Black Mass Forecast

*Lee Allen, Strategic Markets Editor, Scrap, Fastmarkets*

This presentation will cover scrap battery forecast, black mass pricing, and shredding and refining capacities.

#### 9:20 Building Local and Circular Lithium-ion Recycling Solutions and Networks

*Christian Lafrance, Director, Business Development Europe, Lithion Technologies*

#### 9:40 MODERATED Q&A: Session Wrap-Up

*Moderator: Steve Sloop, PhD, President, OnTo Technology LLC*

*Panelists:*

*Akihito Fujita, Co-Head, Research & Consulting, Nomura Research Institute America, Inc.*

*Lee Allen, Strategic Markets Editor, Scrap, Fastmarkets*

*Christian Lafrance, Director, Business Development Europe, Lithion Technologies*

#### 10:00 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing - Sponsored by ARKEMA

#### 10:50 Sustainability Challenges for the Recycling of Present and Emerging Batteries

*Marcel Weil, Scientific Research Group Leader, Research for Sustainable Energy Technologies, ITAS & HIU, Karlsruhe Institute of Technology*

Several studies estimate a tremendous increase of energy-storage demand which causes a strong increase of critical raw-material demand (especially for Co, Ni, Li, natural graphite, and others). Secondary raw materials from the recycling of spent batteries are considered as a potential source to tackle at least a certain fraction of future demand. But there are still challenges for the recycling of used batteries today and in the future.

#### 11:10 Redefining Sustainability: AVL's Blueprint for Eco-Friendly Battery Design and Recycling Excellence

*Stefan Windisch-Kern, Battery Development Engineer, Battery Systems and Functions, AVL List GmbH*

We'll discuss how proper design and engineering choices can boost recyclability and end-of-life strategies, touching on the legislative environment, material selection, and mechanical design, as well as manufacturing techniques. Furthermore, our discussion will dive into AVL's benchmarking program, where we will share concrete examples of how design choices significantly influence end-of-life options and CO2 footprint, investigated during our extensive battery tear-down analysis.

#### 11:30 Sponsored Presentation (Opportunity Available)

#### 11:50 MODERATED Q&A: Session Wrap-Up

*Moderator: Steve Sloop, PhD, President, OnTo Technology LLC*

*Panelists:*

*Marcel Weil, Scientific Research Group Leader, Research for Sustainable Energy Technologies, ITAS & HIU, Karlsruhe Institute of Technology*  
*Stefan Windisch-Kern, Battery Development Engineer, Battery Systems and Functions, AVL List GmbH*

#### 12:10 Networking Lunch (Sponsorship Opportunity Available)

#### 13:10 Dessert Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

### RECYCLING METHODS

#### 13:40 Chairperson's Remarks

*Anna Vanderbruggen, PhD, Process Engineer, GeoResources Institute, University of Lorraine*

#### 13:45 Characterization of Process Water in Lithium-ion Battery Recycling

*Sascha Nowak, PhD, Head of Analytics & Environmental, Electrochemical Energy Technology, University of Münster*

Water-using recycling processes—such as wet crushing and electrohydraulic fragmentation—generate large amounts of contaminated process water, resulting in increased costs for the disposal of hazardous waste and safety guidelines. To improve wastewater management, safety, and sustainability of water-assisted recycling processes, comprehensive knowledge of the battery components in the water are required. Analytical techniques can play an important role during these processes.

#### 14:05 Advances in Recycling Technology and Building Recycling Plants for Spoke and Hydro Metallurgy

*Christian Reiche, CTO, Primobius*

Primobius' innovative recycling technology for LiB integrates shredding and beneficiation to produce Black Mass, which is then processed in a Hydrometallurgy hub. This integrated system efficiently recovers critical metals, minimizes environmental impact, and supports the circular economy by providing sustainable inputs for new battery production.

#### 14:25 Direct Recycle Cathode-Healing and Battery Deactivation to Improve Cost and Safety of the Value Chain

*Steve Sloop, PhD, President, OnTo Technology LLC*

Dr. Sloop will discuss recycling batteries with Cathode-Healing, along with inertization of lithium-ion, design for recycling with PFAS-free components. The approaches are presented in counterpoint of current plans to ship dangerous goods for recycling, repurifying cathode metals, and resynthesizing cathodes for every battery lifecycle. The triple-threat of design for recycling, battery inertization, and Cathode-Healing is presented as a flexible, scalable approach to help make energy storage affordable for everyone.

#### 14:45 MODERATED Q&A: Session Wrap-Up

*Moderator: Anna Vanderbruggen, PhD, Process Engineer, GeoResources Institute, University of Lorraine*

*Panelists:*

*Sascha Nowak, PhD, Head of Analytics & Environmental, Electrochemical Energy Technology, University of Münster*

*Christian Reiche, CTO, Primobius*

*Steve Sloop, PhD, President, OnTo Technology LLC*

#### 15:05 Refreshment Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

#### 15:30 Effects of Over-Discharge on the Quality of Lithium-ion Battery Recycling Products

*Alexandra Kaas, Research Associate, Mechanical Process Engineering and Mineral Processing, Freiberg University of Mining and Technology*

Discharging is performed to ensure safety during a recycling process and can be done to different levels. The effects of over-discharging, e.g., formation of copper on the cathode or coating of the separator, have an influence on the quality of the recycling products, e.g., black mass or metal fractions.



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Examination of whether the new EU regulations can be met with different chemistries (NMC, NCA, LFP) were investigated.

## 15:50 Influences on the Properties of Black Mass from Mechanical Lithium-ion Battery Recycling

*Christian Wilke, Research Associate, TU Bergakademie Freiberg*

During mechanical recycling of lithium-ion batteries, a fine fraction, black mass is produced. This fraction consists of the detached coating of the electrodes and small quantities of impurities. Yield and composition of the black mass are influenced by the preceding processing steps, discharge, comminution, drying, and pyrolysis. This presentation provides an overview of the process settings that affect the black mass properties and outlines how to optimize yield and quality.

**16:10 Sponsored Presentation** (*Opportunity Available*)

## 16:30 MODERATED Q&A: Session Wrap-Up

*Moderator: Anna Vanderbruggen, PhD, Process Engineer, GeoResources Institute, University of Lorraine*

*Panelists:*

*Alexandra Kaas, Research Associate, Mechanical Process Engineering and Mineral Processing, Freiberg University of Mining and Technology*  
*Christian Wilke, Research Associate, TU Bergakademie Freiberg*

**16:50 Networking Reception in the Exhibit Hall with Poster Viewing** (*Sponsorship Opportunity Available*)

**18:00 Close of Day**

## WEDNESDAY 15 MAY

**7:20 Registration Open**

## 7:30 Interactive Breakout Discussions & Morning Coffee

Interactive Breakout Discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

### TABLE 1: Solid State Batteries

*Moderator: Venkataraman Thangadurai, PhD, Professor, Chemistry, University of Calgary*

### TABLE 2: Electrolytes

*Moderator: Gabriel Torres, Director of Product Management, Sionic Energy*

### TABLE 3: Innovations in Recycling Battery Materials & Second Life

*Moderator: Steve Sloop, PhD, President, OnTo Technology LLC*

### TABLE 4: Li-ion NMC Fast Charging New Cells for E-Mobility

*Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.*

### TABLE 5: Battery Raw Materials Supply Chain

*Moderator: Tom Van Bellinghen, Vice President, Marketing & OEM Value Chain, Rechargeable Battery Materials, Umicore*

### TABLE 6: Benefits of Wireless Communication Technology in Battery Management Systems

*Moderator: Stefan Goede, Head of Research & Development, Co-Founder, Munich Electrification GmbH*

### TABLE 7: Opportunities and Potential for New Battery Technologies

*Moderator: Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH*

### TABLE 8: Silicon Anodes and Cells

*Moderator: Benjamin Park, PhD, Founder & CTO, Enevate*

### TABLE 9: Battery Intelligence

*Moderator: Eli Leland, PhD, CTO and Co-Founder, Voltaiq, Inc.*

### TABLE 10: Cell Engineering

*Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH*

### TABLE 11: Advances in Sodium-ion Battery Materials

*Moderator: Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin*

## RECYCLING METHODS

### 8:45 Chairperson's Remarks

*Christian Wilke, Research Associate, TU Bergakademie Freiberg*

### 8:50 Presentation to be Announced by TotalEnergies

### 9:10 Battery Recycling—Influence of Diluent in Solvent Extraction Process

*Blaise Bridier, Performance Liquids Technology Product Professional, ExxonMobil Chemical Europe*

The paradigm of solvent selection presentation will compare several diluents and provide an overview of the properties to take into account in its selection. Diluents are usually the last parameter to be optimized, but the right diluent is a tradeoff between extraction efficiency, process robustness, and for sure safety, environmental concerns, and cost.

### 9:30 Enhancing Recycling of Valuable Materials from Spent Lithium-ion Batteries Using Electrostatic and Magnetic Separations

*Hyeyeon Lee, PhD, Research Fellow, University of Birmingham*

To enable greater elemental recovery and less resource waste, a robust pre-treatment technology is required. This study delineates the utilization of electrostatic and magnetic separation processes across four distinct lithium-ion battery formats and chemistries. These pre-treatment methods thereby facilitate the provision of high-purity materials which can be directly processed back into battery components, providing a secondary critical mineral ore for the battery industry whilst reducing secondary pollution concerns.

### 9:50 Innovative Approach to Lithium-ion Battery Recycling: Utilizing Froth Flotation with Bio-Based Cyrene Solvent as a Sustainable Binder Removal Pre-Treatment

*Anna Vanderbruggen, PhD, Process Engineer, GeoResources Institute, University of Lorraine*

Froth flotation holds potential for separating cathode- and anode-active material in lithium-ion battery recycling and therefore increasing the recycling rate. Effective flotation separation requires removal of the organic binder (PVDF) from active particles' surfaces. This study investigates pre-treatment of an industrial black mass with the bio-based solvent Cyrene to efficiently remove the binder and compares it to the pyrolysis route.

### 10:10 Advancing Sustainability: Fast-Tracking Closed Loop Industry in Europe

*Tomasz Poznar, Vice President, Strategy, Ascend Elements*

Terms "sustainability" and "closed loop" are often used to describe battery recycling processes like pyrometallurgy and hydrometallurgy, but these traditional recycling processes are just the first steps in a battery materials journey. The typical outputs of battery recycling require processing before they can go into new EV batteries. This presentation puts recycled battery materials under the microscope and explores the steps to engineer new, battery-ready cathode and anode active materials.

### 10:30 MODERATED Q&A: Session Wrap-Up

*Moderator: Christian Wilke, Research Associate, TU Bergakademie Freiberg*

*Panelists:*

*Blaise Bridier, Performance Liquids Technology Product Professional, ExxonMobil Chemical Europe*

*Hyeyeon Lee, PhD, Research Fellow, University of Birmingham*

*Anna Vanderbruggen, PhD, Process Engineer, GeoResources Institute, University of Lorraine*

*Tomasz Poznar, Vice President, Strategy, Ascend Elements*

### 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

(*Sponsorship Opportunity Available*)





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## 11:20 Graphite Anode Recycling: An Environmentally-Friendly Approach to Supply Chain Localization

*Rakan Ashour, PhD, Senior Process Development Engineer, Koura*

In this talk, we will present data showing that the physio-chemical attributes and electrochemical performance of recycled graphite are on-par with pristine commercial graphite anode active materials. We will highlight the environmental, supply chain, and economic benefits for recycling graphite from lithium-ion batteries. Finally, we will discuss how recycled graphite can be a viable anode active material for Li-ion batteries.

## EXPANDING GLOBAL RECYCLING MARKETS

### 11:40 Recycling of Li-ion Batteries: Empower Your Understanding of the Competitive and Technological Landscape Thanks to Patent Analysis

*Filippo Farina, PhD, Technology & Patent Analyst, Energy, KnowMade*

The global growing demand for batteries has led to the increasing interest for Li-ion batteries recycling. Players on the market need to stay ahead of the technological trends and to understand their competitive environment. Through patent landscape analysis, we will uncover IP trends and key IP players, with a focus on cathode active materials.

**12:00 Sponsored Presentation** (*Opportunity Available*)

### 12:20 MODERATED Q&A: Session Wrap-Up

*Moderator: Christian Wilke, Research Associate, TU Bergakademie Freiberg*

*Panelists:*

*Rakan Ashour, PhD, Senior Process Development Engineer, Koura*

*Filippo Farina, PhD, Technology & Patent Analyst, Energy, KnowMade*

**12:40 Networking Lunch** (*Sponsorship Opportunity Available*)

### 14:00 Dessert Break in the Exhibit Hall with Poster Viewing

(*Sponsorship Opportunity Available*)

**14:30 Close of Conference**



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# BATTERY ENGINEERING

Building Better Batteries through Improvements in Battery Safety, Cell Engineering, and Battery Management Systems

## MONDAY 13 MAY

12:00 Registration Open till 17:00

## TUESDAY 14 MAY

7:00 Registration and Morning Coffee

## CHARGING

### 8:30 Organizer's Remarks

Victoria Mosolgo, Conference Producer, Cambridge EnerTech

### 8:35 Chairperson's Remarks

Christiane Essl, Researcher, Battery Safety, VIRTUAL VEHICLE Research GmbH

### 8:40 Safe EV Charging

Pawel Fudala, Deployment Lead, EMEA Supercharger, Tesla Motors

Modern EV charging systems implement several safeguards to minimise the hazard to people and property in the case of unexpected events. This presentation will review safeguards commonly found within an EV, at the charger, and in building infrastructure, and how they work together to minimise risk of DC fast charging installations. The presentation will place emphasis on best practices when considering indoor DC charging installations.

### 9:00 Innovative Battery Systems—Achieving High Energy Density while Improving Fast-Charging Capabilities and Safety

Vaneet Kumar, Vice President, European R&D Center, SVOLT Energy Technology Europe GmbH

SVOLT's next-generation cell-to-pack EV batteries deliver superior energy density, extended lifespan, and rapid charging capabilities while ensuring best-in-class safety. This is achieved by innovative system design and battery cells which are specifically designed for cell-to-pack architecture.

### 9:20 FEATURED PRESENTATION: A Standardized Lifecycle of Automotive HV-Batteries

Matthias Heming, Head of Design Battery Systems & Stack, Volkswagen Group

Sebastian Schoeniger, Head of Development Battery Cells, Volkswagen Group

Volkswagen Group is aiming for 70% of electric vehicle sales in 2030. The battery development focusses on attractive products in the segments: Affordability, Range, & Performance. With standardized components, the complexity and variety of variants in the development, series, after-sales, and recycling of HV batteries can be minimized. This creates the best conditions for maintaining the value chain in the Volkswagen Group, reducing costs and controlling the life cycle.

### 9:40 MODERATED Q&A: Session Wrap-Up

Moderator: Christiane Essl, Researcher, Battery Safety, VIRTUAL VEHICLE Research GmbH

Panelists:

Matthias Heming, Head of Design Battery Systems & Stack, Volkswagen Group

Sebastian Schoeniger, Head of Development Battery Cells, Volkswagen Group

Pawel Fudala, Deployment Lead, EMEA Supercharger, Tesla Motors

Vaneet Kumar, Vice President, European R&D Center, SVOLT Energy Technology Europe GmbH

10:00 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing - Sponsored by ARKEMA

## THERMAL MANAGEMENT AND MATERIALS

### 10:50 Driving Innovations in Battery Materials and Cell Concepts by Focusing on Lab-to-Pilot Scale-Up

Falko Schappacher, PhD, Managing Director, MEET Battery Research Center, University of Muenster

The process of driving innovations in battery materials and cell concepts through lab-to-pilot scale-up involves transitioning promising developments from the laboratory to larger-scale production for testing and optimisation. This entails the exploration and development of novel materials, innovative cell architectures, and scalable production processes.

### 11:10 Thermal Management Materials for EV Battery Module & Packs: High Energy Density and Safety

Tomohiro Kawai, PhD, Senior Chief Scientist & Leader, Product Design, Mitsubishi Chemical Corp.

Takata Nobuaki, Senior Manager, Mitsubishi Chemical Corp.

Mitsubishi Chemical's thermal management materials for EV battery module/packs are spotlighted for their integral role in enhancing high energy density and safety. Demonstrations of these materials' effectiveness in fast-charging and thermal stability will be conducted through simulations and test results. The key features presented include flame-retardant thermoplastic composite and inter-cell spacers. Strategies for mitigating thermal runaway will be explored.

### 11:30 Heat Recovery and Oxygen Recycling in CAM- Calcination Kilns with ONEJOON RHK-ecoCAM



Laurenz Plöchl, Sr. Key Account Manager, Battery Materials, ONEJOON GmbH

In CAM production huge amounts of gas and energy are used on a once-through basis today in the roller hearth kiln (RHK), accounting for a major part of a LiB carbon footprint.

This presentation gives details of state-of-the-art equipment and technology for recycling up to 80% of the process gas and recovery of most of the off-gas energy into valuable heat and power. This technology offers significant OPEX and carbon reduction opportunities for CAM manufacturers.

### 11:50 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

Moderator: Christiane Essl, Researcher, Battery Safety, VIRTUAL VEHICLE Research GmbH

Panelists:

Falko Schappacher, PhD, Managing Director, MEET Battery Research Center, University of Muenster

Tomohiro Kawai, PhD, Senior Chief Scientist & Leader, Product Design, Mitsubishi Chemical Corp.

Laurenz Plöchl, Sr. Key Account Manager, Battery Materials, ONEJOON GmbH

12:10 Networking Lunch (Sponsorship Opportunity Available)

13:10 Dessert Break in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

## BATTERY FAILURE

### 13:40 Chairperson's Remarks

Michael Schoenleber, Co-Founder & CTO, Batemo GmbH

### 13:45 Investigating the Ability of Plastic Current Collectors and Thermally-Stable Separators to Isolate Internal Short

Eric Darcy, PhD, Battery Technical Discipline Lead, Power Systems, NASA Johnson Space Center

As we push the specific energy over 250 Wh/kg in 21700 Li-ion cells with cathode metalized plastic current collectors (PCC), we lose tolerance to nail penetration. Adding thermally-stable separators, anode PCCs, and reducing cathode-active material adhesion to the collector didn't improve nail penetration safety. Jellyroll winding tension appears to play a major role in cylindrical cells since nail tolerance is achieved in prismatic pouch cells > 250 Wh/kg.



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# BATTERY ENGINEERING

Building Better Batteries through Improvements in Battery Safety, Cell Engineering, and Battery Management Systems

## 14:05 Comparing Safety-Relevant Parameters of Failing Batteries with Different Energy Density

*Christiane Essl, Researcher, Battery Safety, VIRTUAL VEHICLE Research GmbH*  
Since many factors influence the results of battery experiments, it is important to analyse them—one important factor is the gravimetric energy density. In this presentation, results of failing state-of-the-art battery cells will be presented and discussed. The focus will be on the comparison of NMC cells with different gravimetric energy density. The results will be compared in the categories: thermal behavior, vent gas production, and vent gas composition.

## 14:25 Is Flexibility Contrary to High Throughput in Battery Cell Manufacturing? A Model-Based Approach for the Rapid Ramp-up of Innovative Production Equipment

*Juergen Fleischer, PhD, Manager of Machines, Equipment & Process Automation, Karlsruhe Institute of Technology*  
To reconcile the two seemingly conflicting goals of highly flexible processes and high production volumes, new concepts are needed for singulation and stacking processes. Combining the traditional discrete stacking process with a continuous cutting operation will allow rapid changes in electrode dimensions. By setting up digital twins of the machinery, it is possible to virtually commission control components and deduce machine influences on material behaviour and product quality.

## 14:45 MODERATED Q&A: Session Wrap-Up

*Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH*  
*Panelists:*

*Eric Darcy, PhD, Battery Technical Discipline Lead, Power Systems, NASA Johnson Space Center*

*Christiane Essl, Researcher, Battery Safety, VIRTUAL VEHICLE Research GmbH*  
*Juergen Fleischer, PhD, Manager of Machines, Equipment & Process Automation, Karlsruhe Institute of Technology*

## 15:05 Refreshment Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## CELL ENGINEERING AND SELECTION

### 15:30 LFP Battery Cells Made in Europe—A Matter of Course in the Future, or Not Feasible? Opportunities and Challenges of a Domestic LFP Supply Chain

*Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH*  
LFP based battery cells see increasing popularity in the e-mobility market promising a safe and cost-effective solution. To decrease dependency on Chinese import, more LFP cell capacities are planned to be installed in Europe—but can the technology keep its low cost footprint in a western environment? This question is answered by analysing the impact of local manufacturing conditions on the LFP cell cost structure.

### 15:50 Battery Cell Design Revealed—Why Batteries Are Built the Way They Are

*Michael Schoenleber, Co-Founder & CTO, Batemo GmbH*  
In this talk we will discuss different performance targets of battery cells and how these are affected by material choice and cell design. We will illustrate some of the fundamental sensitivities of cell design by virtually designing and re-designing different cells and studying the impact on cell performance.

### 16:10 SafeCore - An Internal Fuse to Help Prevent Thermal Runaway

*Dan Squiller, CEO, Amionx*  
SafeCore is a material that is coated on the current collector that acts like a fuse to help prevent thermal runaway. It protects against overcharge and internal short, and can enable next-generation chemistries like lithium metal and nanosilicon. Amionx has successfully transferred its patented SafeCore technology to multiple manufacturers to enhance their cell safety performance.



## 16:30 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH*  
*Panelists:*  
*Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH*  
*Dan Squiller, CEO, Amionx*

## 16:50 Networking Reception in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## 18:00 Close of Day

## WEDNESDAY 15 MAY

### 7:20 Registration Open

### 7:30 Interactive Breakout Discussions & Morning Coffee

Interactive Breakout Discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

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*Moderator: Venkataraman Thangadurai, PhD, Professor, Chemistry, University of Calgary*

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#### TABLE 5: Battery Raw Materials Supply Chain

*Moderator: Tom Van Bellinghen, Vice President, Marketing & OEM Value Chain, Rechargeable Battery Materials, Umicore*

#### TABLE 6: Benefits of Wireless Communication Technology in Battery Management Systems

*Moderator: Stefan Goede, Head of Research & Development, Co-Founder, Munich Electrification GmbH*

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#### TABLE 8: Silicon Anodes and Cells

*Moderator: Benjamin Park, PhD, Founder & CTO, Enevate*

#### TABLE 9: Battery Intelligence

*Moderator: Eli Leland, PhD, CTO and Co-Founder, Voltaiq, Inc.*

#### TABLE 10: Cell Engineering

*Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH*

#### TABLE 11: Advances in Sodium-ion Battery Materials

*Moderator: Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin*

## SAFETY AND BATTERY MANAGEMENT SYSTEMS

### 8:40 Organizer's Remarks

*Victoria Mosolgo, Conference Producer, Cambridge EnerTech*

### 8:45 Chairperson's Remarks

*Natalia Lebedeva, PhD, Scientific Project Officer, Energy Storage, European Commission*

### 8:50 Advancements in Elastomeric Materials for Cell-to-Cell Pressure Management

*Katleen Van Nuffel, Sr. Technical Service Engineer, Rogers Corporation*

Elastomeric pads are vital for pressure management in pouch and prismatic cells, providing cushioning and adaptability for cell breathing and expansion due to dendritic growth and gas evolution. This presentation assesses the influence of pad material selection on overall pack performance. Various materials





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(silicone, polyurethane) with differing mechanical properties were tested for their impact on cycle life in pouch and prismatic formats.

## 9:10 Safety of Li-ion Batteries: Current Challenges and R&D Needs

*Natalia Lebedeva, PhD, Scientific Project Officer, Energy Storage, European Commission*

In this presentation, various aspects of thermal runaway and propagation in Li-ion batteries, including thermal runaway detection criteria and questions facing development of a regulatory test procedure, are discussed. Liquid, gas, and solid emissions from Li-ion batteries in several scenarios including battery fire are analysed allowing more quantitative risk assessment of such emissions.

## 9:30 Future BMS Architectures—Lower Cost, Better Safety, and Faster Time-to-Market

*Stefan Goede, CTO, Co-Founder, Munich Electrification GmbH*

Battery management systems are a decisive factor for successful and fast development of batteries. Oftentimes, integrators struggle with managing the increasing software complexity in modern automotive and heavy-duty ECUs. Yet, time-to-market is critical and battery and cell variants are only growing. This talk presents a view on future BMS architectures, taking into consideration industry trends such as: the SW-defined vehicle, Ethernet to the Edge, and new safety goals.

## 9:50 Next-Generation Intelligent Battery Management System with Enhanced Safety for Transportation Electrification

*Sheldon Williamson, PhD, Professor & Canada Research Chair, Electrical & Computer & Software Engineering, University of Ontario Institute of Technology*  
Range anxiety is a key reason that consumers are reluctant to embrace electric vehicles (EVs). However, none of today's EVs allow fast charging in cold or even cool temperatures due to the risk of lithium plating, the formation of metallic lithium that drastically reduces battery life and even results in safety hazards. Here, we present an approach that enables 15-minute fast charging of Li-ion batteries at any temperature (-50 °C).

## 10:10 In the Line of Fire: Parameters for Torch and Grit Testing

*John Williams, Vice President, Technical Services, Aspen Aerogels*

A cell in thermal runaway releases hot gas and high-velocity particulates into a pack's confined spaces. Safely ushering those hazards before they trigger adjacent cells is a plumbing problem involving cell chemistry, vent design, and architectural layout. Benchtop torch and grit (TaG) testing can be a useful tool, but the industry is not aligned on the inputs to simulate a thermal runaway event. This session explores parameters engineers can use to develop effective gas-management strategies.

aspen | aerogels

## 10:30 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Natalia Lebedeva, PhD, Scientific Project Officer, Energy Storage, European Commission*

*Panelists:*

*Stefan Goede, CTO, Co-Founder, Munich Electrification GmbH*

*Sheldon Williamson, PhD, Professor & Canada Research Chair, Electrical & Computer & Software Engineering, University of Ontario Institute of Technology*

*John Williams, Vice President, Technical Services, Aspen Aerogels*

## 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## CELL ENGINEERING AND PROTOTYPING

### 11:20 Technology Developments from Cell Selection to Design

*Alastair Hales, PhD, Lecturer, Mechanical Engineering, University of Bristol*

Is specific energy density the right optimisation metric to select the most appropriate lithium-ion cell for application in an automotive battery pack? Here, About:Energy's reduced-order models are used to examine the real-life performance benefits and drawbacks of cell selection against different performance metrics. These models are built with industry-leading parameterisation techniques. These models enable cell-to-cell comparison across the vast suite of commercially available lithium-ion cells, as set out.

### 11:40 Cell Engineering and Prototyping

*Alexander Roberts, PhD, Professor of Energy Storage, Centre for eMobility and Clean Growth, Coventry University*

As new materials progress from laboratory to commercial reality, a key aspect in predicting final performance is device prototyping. This work demonstrates the effects of cell size and design on prototype prediction of final device performance. Through variation of design and size of Li-ion pouch cells, from single-layer through many layer, relationships with parameters such as capacity, rate, resistance, and lifetime are considered relative to those of final device.

### 12:00 How Do Conductive Electrode Coatings Optimize the Performance of Dry Coated Batteries?

Henkel

*Tobias Knecht, PhD, Battery Cells Specialist, Automotive Components, Henkel Adhesive Technologies*

Dry coating of lithium-ion batteries has the potential to revolutionize battery production through a reduced solvent, energy and footprint demand. However, dry coated electrodes suffer from poor adhesion between the dry film and current collector that leads to the demand of a pre-coating. We want to discuss how carbon coatings of current collectors can enable dry battery manufacturing and improve battery cell performance.

### 12:20 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Natalia Lebedeva, PhD, Scientific Project Officer, Energy Storage, European Commission*

*Panelists:*

*Alastair Hales, PhD, Lecturer, Mechanical Engineering, University of Bristol*

*Alexander Roberts, PhD, Professor of Energy Storage, Centre for eMobility and Clean Growth, Coventry University*

### 12:40 Networking Lunch *(Sponsorship Opportunity Available)*

### 14:00 Dessert Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

### 14:30 Close of Conference



14-15 MAY 2024 | STRASBOURG, FRANCE

# HIGH-PERFORMANCE BATTERY MANUFACTURING

Global Production of Safe, Efficient, Higher Energy Density Batteries

## MONDAY 13 MAY

12:00 Registration Open till 17:00

## TUESDAY 14 MAY

7:00 Registration and Morning Coffee

### GLOBAL MARKET OPPORTUNITIES IN BATTERY MANUFACTURING

#### 8:30 Organizer's Remarks

*Craig Wohlers, Executive Director, Conferences, Cambridge EnerTech*

#### 8:35 Chairperson's Remarks

*Jochen Zausch, PhD, Senior Scientist, Team-Leader Electrochemistry and Batteries, Flow and Material Simulation, Fraunhofer ITWM*

#### 8:40 Technology Trends in Sodium-ion Batteries and Market Penetration

*Christoph Neef, PhD, Senior Scientist, Fraunhofer Institute for Systems and Innovation Research ISI*

A number of manufacturers have launched their first generation of sodium-ion batteries in 2023. The technologies used differ significantly and cover a wide range in cathode and anode materials and cell design. The presentation highlights current and future SIB technologies and makes an assessment of the future market development.

#### 9:00 Supporting the Growth of the European Battery Ecosystem by Building the Bridge between Europe and Asia

*Christian Ruediger, PhD, Managing Director, Chem4Batteries GmbH*

Based on our in-depth industry knowledge and long-year trusted relationships along the entire battery value chain, from raw material mining to battery cell making, paired with our fundamental electrochemical expertise, we are in the unique position to seek, assess, and develop new businesses. We help our clients to navigate through new battery technology trends and their shift into localisation by building strategic collaborations and alliances.

#### 9:20 Sustainable Battery Manufacturing and Use for a Greener Tomorrow

*David Verner, Director of Energy Strategy, Gresham Smith & Partners*

The shift in the automotive landscape towards electric vehicles (EVs) took a defining turn when the GMC Hummer EV emerged. The transformation of an iconic gas-guzzler into an EV muscle car heralded a meaningful change in the market. However, to realize the environmental aspirations of EVs, a comprehensive evaluation of the battery supply chain, from sourcing raw materials to recycling, is imperative.

#### 9:40 MODERATED Q&A: Session Wrap-Up

*Moderator: Jochen Zausch, PhD, Senior Scientist, Team-Leader Electrochemistry and Batteries, Flow and Material Simulation, Fraunhofer ITWM*

*Panelists:*

*Christoph Neef, PhD, Senior Scientist, Fraunhofer Institute for Systems and Innovation Research ISI*

*Christian Ruediger, PhD, Managing Director, Chem4Batteries GmbH*

*David Verner, Director of Energy Strategy, Gresham Smith & Partners*

10:00 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing - Sponsored by ARKEMA

### ADVANCES IN CELL MANUFACTURING

#### 10:50 Future Manufacturing Approaches Including Advances in Pre-Lithiation

*Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH*

Outlook on achieving manufacturing targets with on-demand supply balance for Li, Ni, Co, Mn, and graphite; alternative feedstock and processing routes; comparing costs and CO2 emission; strategies to secure critical raw materials adopted by major players; framework for holistic evaluation of manufacturing strategies.

#### 11:10 Meeting EV Demand and Leapfrogging Supply Chain Hurdles with Localised Battery Production

*Nan-Hung Lester Yeh, PhD, Research & Development Manager, Advanced Battery Technologies, E-One Moli Energy CORP.*

*Rick Constantino, PhD, CTO & Co-Founder, Manufacturing, Group14 Technologies*

#### 11:50 MODERATED Q&A: Session Wrap-Up

*Moderator: Jochen Zausch, PhD, Senior Scientist, Team-Leader Electrochemistry and Batteries, Flow and Material Simulation, Fraunhofer ITWM*

*Panelists:*

*Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH*

*Nan-Hung Lester Yeh, PhD, Research & Development Manager, Advanced Battery Technologies, E-One Moli Energy CORP.*

*Rick Constantino, PhD, CTO & Co-Founder, Manufacturing, Group14 Technologies*

12:10 Networking Lunch (Sponsorship Opportunity Available)

13:10 Dessert Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

#### 14:00 Organizer's Remarks

*Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH*

### GLOBAL MARKET OPPORTUNITIES IN BATTERY MANUFACTURING



#### 14:05 FEATURED PRESENTATION: Disruption of Existing Supply Chain for Extraction and Processing of Rare Metals and the Manufacture of Battery Cells

*John Kwon, General Counsel of Global Legal & Strategy, Contemporary Amperex Technology Limited (CATL)*

Since the United States is a significant market for EVs, some battery manufacturers have had to change their global strategies and invest in the construction of battery plants in the United States. This is resulting in the re-organization of existing supply chains around the world. Similar disruption to existing supply chains will further be exacerbated with the imminent passage of the European Union Critical Raw Minerals Act of 2023.

### ADVANCES IN CELL MANUFACTURING

#### 14:25 Physical Models for Process Simulation of Lithium-ion Cell Production

*Jochen Zausch, PhD, Senior Scientist, Team-Leader Electrochemistry and Batteries, Flow and Material Simulation, Fraunhofer ITWM*

We propose to apply physics-based computer simulation in order to support the optimisation of specific process steps in the production of lithium ion batteries and pack assembly. We will describe our simulation approach and discuss how simulation results can be used to improve process design.





14-15 MAY 2024 | STRASBOURG, FRANCE

# HIGH-PERFORMANCE BATTERY MANUFACTURING

Global Production of Safe, Efficient, Higher Energy Density Batteries

## 14:45 MODERATED Q&A: Session Wrap-Up

Moderator: Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH

Panelists:

John Kwon, General Counsel of Global Legal & Strategy, Contemporary Amperex Technology Limited (CATL)

Jochen Zausch, PhD, Senior Scientist, Team-Leader Electrochemistry and Batteries, Flow and Material Simulation, Fraunhofer ITWM

## 15:05 Refreshment Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## 15:30 Presentation to be Announced by Honeywell Process Solutions

## 15:50 Novel, Dry Manufacturing Process for Low Cost, Low Carbon, High Energy Density, Mixed-Metal Oxide Cathode Active Materials

Joseph Adiletta, Vice President of Commercialization, Sylvatex

The cathode is the battery's most costly and carbon-intensive part; thus, it creates a critical supply chain bottleneck in realising the decarbonization impact we desire. A lower-cost, more sustainably-manufactured EV is achievable in the near term by employing a future-proofed next-generation cathode manufacturing process.

## 16:10 A Rapid Electrochemical Characterization Technique for Cell Manufacturing

Kevin Wood, Director, EBIX, Voltaiq Inc

Electrochemical characterization techniques have seen limited use in manufacturing, primarily because they are generally too slow to be practical in a high-throughput environment. We will present a rapid electrochemical characterization technique suitable for manufacturing that can reveal information about the transport, kinetic, and thermodynamic properties of a cell and can be used for lifetime prediction, defect detection, and root-cause analysis at scale.

VOLTAIQ

## 16:30 MODERATED Q&A: Session Wrap-Up

Moderator: Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH

Panelists:

Joseph Adiletta, Vice President of Commercialization, Sylvatex

Kevin Wood, Director, EBIX, Voltaiq Inc

## 16:50 Networking Reception in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## 18:00 Close of Day

### WEDNESDAY 15 MAY

## 7:20 Registration Open

## 7:30 Interactive Breakout Discussions & Morning Coffee

Interactive Breakout Discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

### TABLE 1: Solid State Batteries

Moderator: Venkataraman Thangadurai, PhD, Professor, Chemistry, University of Calgary

### TABLE 2: Electrolytes

Moderator: Gabriel Torres, Director of Product Management, Sionic Energy

### TABLE 3: Innovations in Recycling Battery Materials & Second Life

Moderator: Steve Sloop, PhD, President, OnTo Technology LLC

### TABLE 4: Li-ion NMC Fast Charging New Cells for E-Mobility

Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

### TABLE 5: Battery Raw Materials Supply Chain

Moderator: Tom Van Bellinghen, Vice President, Marketing & OEM Value Chain, Rechargeable Battery Materials, Umicore

### TABLE 6: Benefits of Wireless Communication Technology in Battery Management Systems

Moderator: Stefan Goede, Head of Research & Development, Co-Founder, Munich Electrification GmbH

### TABLE 7: Opportunities and Potential for New Battery Technologies

Moderator: Ines Miller, Team Lead Battery Cells, E Mobility, P3 Automotive GmbH

### TABLE 8: Silicon Anodes and Cells

Moderator: Benjamin Park, PhD, Founder & CTO, Enevate

### TABLE 9: Battery Intelligence

Moderator: Eli Leland, PhD, CTO and Co-Founder, Voltaiq, Inc.

### TABLE 10: Cell Engineering

Moderator: Michael Schoenleber, Co-Founder & CTO, Batemo GmbH

### TABLE 11: Advances in Sodium-ion Battery Materials

Moderator: Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin

## ADVANCES IN CELL MANUFACTURING

### 8:45 Chairperson's Remarks

David Verner, Director of Energy Strategy, Gresham Smith & Partners

### 8:50 Presentation to be Announced

The post-drying of electrodes for lithium-ion batteries just before cell assembly is needed to ensure that the moisture content is below a critical level, as the remaining water can lead to cell degradation. We investigated the combination of different post-drying procedures on Li and Na-ion battery and evaluated the benefits of IR assisted vacuum drying in a continuous roll to roll process.

EXCELITAS  
TECHNOLOGIES

### 9:10 Addressing Scale-Up Challenges in Battery Materials

Keri Goodwin, PhD, Chief Technologist, Formulation, CPI

Presentation will detail CPI's work in supporting the main challenges faced by innovators in battery materials development. Several topics will be presented, including details of a new facility for open access synthetic scale-up development of novel active materials, supporting the transition from lab scale to commercial validation in industrially relevant cell formats. This facility will also incorporate process analytical tools (PAT), soft sensors, and modelling in development of materials synthesis.

### 9:30 Breaking the Barrier between Digital and Reality: An Integrated Software Solution for Battery Manufacturing Optimisation and Personalised Training

Alejandro A. Franco, PhD, Professor, Reactivity & Chemistry of Solids Lab, University of Picardie Jules Verne

In this lecture I present the latest research carried out in my group regarding the development of digital twins of battery manufacturing processes. I present also, an innovative software solution integrating data management, simulation, manufacturing optimization, and personalised training capabilities. Such a software can be used in both computer and mixed reality environments, breaking the barrier between the digital and the real worlds.

### 9:50 LIOVIX Technology: Li Metal Anode Innovation at Scale

Marina Yakovleva, Director, R&D and New Business Development, Arcadium Lithium

Industry needs to monetize on and scale up innovative and sustainable solutions that can improve battery performance, safety, and manufacturing efficiency of the lithium metal anode. The core of Livent technology is LIOVIX, proprietary printable lithium formulation. The ability to print lithium metal anodes opens the pathway for the ranges of anode width and thickness, and allows cell manufacturer to easily change cell design and format to meet application requirements.



14-15 MAY 2024 | STRASBOURG, FRANCE

# HIGH-PERFORMANCE BATTERY MANUFACTURING

Global Production of Safe, Efficient, Higher Energy Density Batteries

## 10:10 New Trends in Continuous Mixing of Battery Electrode Masses

*Massimo Bernert, Sales Manager, Coperion GmbH*

The state-of-the-art and dominant process for mixing of electrode masses is still the batch process. However, as a system supplier for the complete mixing process, we are currently noticing that inquiries from Europe and the USA are increasingly focusing on continuous mixing with extruder systems. The reasons for this are cost- and process-related advantages. This presentation will introduce the continuous mixing process, shows the advantages and identify future trends in mixing technology.

## 10:30 MODERATED Q&A: Session Wrap-Up

*Moderator: David Verner, Director of Energy Strategy, Gresham Smith & Partners*

*Panelists:*

*Keri Goodwin, PhD, Chief Technologist, Formulation, CPI*

*Alejandro A. Franco, PhD, Professor, Reactivity & Chemistry of Solids Lab, University of Picardie Jules Verne*

*Marina Yakovleva, Director, R&D and New Business Development, Arcadium Lithium*

*Massimo Bernert, Sales Manager, Coperion GmbH*

## 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## 11:20 Introduction of the Beff Platform: Comprehensive Support from Cell Development to Production.

*Shunsuke Amagai, Founder & Co-CEO, Beff*

Since our company's inception, we have collaborated with cell manufacturers and automotive OEMs to address numerous development and production challenges related to cells. Leveraging the expertise of our engineers who have extensive experience in the lithium-ion battery field, we offer comprehensive solutions from cell design to mass production. In this presentation, we will showcase the development methodologies using the Beff Platform, complemented by real-world examples.

## 11:40 Optimising Battery Pack and Module Production Tests

*Paul Scharfe, Battery Production, Transportation Business Unit, National Instruments*

In this session, we will focus on the current challenges that we see in battery pack and module production tests through the latest electrical validation test techniques. We will also talk about the fast amount of data that is generated in this process and how it can be used through smart data analytics tools to influence your overall efficiency.



## 12:00 Empowering Ecological Circularity in Battery Technology: From Materials to Manufacturing and Recycling

*Wenjun Lin, Director, International BU, ONGOAL TECHNOLOGY CO., LTD.*

In today's battery industry, ONGOAL TECH explores the real-world solutions shaping today's battery industry – from the production of battery materials to the operations of Cell Gigafactories and sustainable black mass recovery. Delve into the latest large scale manufacturing equipment evolution and technological trends and glean insights from market leaders who are setting benchmarks in efficiency and energy saving.

## 12:20 MODERATED Q&A: Session Wrap-Up

*Moderator: David Verner, Director of Energy Strategy, Gresham Smith & Partners*

*Panelists:*

*Shunsuke Amagai, Founder & Co-CEO, Beff*

*Paul Scharfe, Battery Production, Transportation Business Unit, National Instruments*

## 12:40 Networking Lunch *(Sponsorship Opportunity Available)*

## 14:00 Dessert Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## 14:30 Close of Conference





14-15 MAY 2024 | STRASBOURG, FRANCE

# GRID-SCALE ENERGY STORAGE EUROPE

Overcoming the Hurdles to a Renewable & Sustainable Future

Co-Located Event

## MONDAY 13 MAY

12:00 Registration Open till 17:00

## TUESDAY 14 MAY

7:00 Registration and Morning Coffee

## GRID-SCALE ENERGY STORAGE MARKET

### 8:30 Organizer's Remarks

*Craig Wohlers, Executive Director, Conferences, Cambridge EnerTech*

### 8:35 Chairperson's Remarks

*Matthias Vetter, PhD, Department Head, Electrical Energy Storage, Fraunhofer Institute for Solar Energy Systems ISE*

### 8:40 Exploring Stationary Storage Markets and Costs

*Benjamin Campbell, Manager, Battery Research, E Source*

This presentation provides an analysis of the current state of stationary energy storage markets, focusing on key trends in demand and technology adoption. Battery costs will be central to this session, with a focus on how new technologies are impacting stationary storage project costs and how we expect markets will respond to changing costs.

### 9:00 Mapping Energy Storage Technologies to Future Grid Applications

*Chloe Herrera, Energy Storage Analyst, Lux Research*

As energy systems become decarbonized by the use of intermittent renewables, multiple applications are demanding increased energy storage. The requirements of each of these applications vary widely, and no single energy storage technology will satisfy them all. This presentation will outline the key economic and technical metrics across technologies and provide a framework to map them to various grid-scale applications.

### 9:20 Grid Storage Forecast and Materials Requirements

*Sam Jaffe, Business Development Senior Manager, Addionics*

Grid storage is fast growing to become a large market for batteries throughout the world. This presentation will explore the growth of the grid storage market and look at battery cathode breakdown, from LFP to Sodium Ion. It will also estimate the amount of materials required to meet the forecasts.

### 9:40 MODERATED Q&A: Session Wrap-Up

*Moderator: Matthias Vetter, PhD, Department Head, Electrical Energy Storage, Fraunhofer Institute for Solar Energy Systems ISE*

*Panelists:*

*Benjamin Campbell, Manager, Battery Research, E Source*

*Chloe Herrera, Energy Storage Analyst, Lux Research*

*Sam Jaffe, Business Development Senior Manager, Addionics*

### 10:00 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing - Sponsored by ARKEMA

### 10:50 Strategies for Monetizing Stationary Battery Storage Systems: Case of German Power Market

*Farzad Sarfarazi, Energy System Expert, Accenture*

With the decreasing prices of stationary battery systems and recent regulatory clarifications, they are becoming increasingly attractive in the German power market. This presentation discusses strategies for capitalizing on these systems, analyzing market trends, regulatory frameworks, and technological advancements. It also explores the potential for generating revenue through stacking grid services, energy arbitrage, and the integration of renewable energy sources, aiming to enhance profitability and support the sustainable energy system transition.

### 11:10 Energy Storage Market Expansion in Europe

*Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH*

The energy storage market in Europe is undergoing significant expansion, driven by increased demand for sustainable energy solutions. This presentation will look at innovative technologies and supportive policies that are fostering growth and positioning Europe as a key global player in advancing energy storage solutions.

### 11:30 Sponsored Presentation (Opportunity Available)

### 11:50 MODERATED Q&A: Session Wrap-Up

*Moderator: Matthias Vetter, PhD, Department Head, Electrical Energy Storage, Fraunhofer Institute for Solar Energy Systems ISE*

*Panelists:*

*Farzad Sarfarazi, Energy System Expert, Accenture*

*Wolfgang Bernhart, Senior Partner, Automotive Competence Center, Roland Berger Strategy Consultants GmbH*

### 12:10 Networking Lunch (Sponsorship Opportunity Available)

### 13:10 Dessert Break in the Exhibit Hall with Poster Viewing (Sponsorship Opportunity Available)

## GRID-SCALE ENERGY STORAGE MARKET

### 13:40 Chairperson's Remarks

*Sam Jaffe, Business Development Senior Manager, Addionics*

### 13:45 Battery Storage Investment Environment in Different Europe Countries

*Karolis Kiguolis, Founder, Exigere Responsum*

Why do we have a different battery payback scenario in Europe? What determines that some countries located in the geographical part of Europe are significantly more advanced than their neighbors? Why, at first glance, do EU regulatory standards turn out to be completely different in different European countries? What do we see in the years 2024-2030 as the leaders of battery best investment practices in the EU?

## INNOVATION IN GRID-SCALE ENERGY STORAGE

### 14:05 Multi-use Strategies for Behind-the-Meter and Front-of-the-Meter Battery Storage Applications

*Matthias Vetter, PhD, Department Head, Electrical Energy Storage, Fraunhofer Institute for Solar Energy Systems ISE*

For a secure and reliable power supply based on 100% renewable energy sources, decentralized and centralized battery storage systems are needed on a large scale and have to take over various tasks, such as providing grid services and storing of surplus amount of energy to be used at a later point of time. In this context, highly sophisticated operating control strategies are needed to enable multi-use concepts and revenue stacking.

### 14:25 From Electric Vehicles to Energy Storage

*Thomas Fedderau, Senior Product Manager, EIA, UL International Germany*

"From electric vehicles to energy storage" lecture will show how UL standards support safety lifecycle of EV and ESS batteries. It will give an overview and partly detailed insight in UL 2580 for Vehicles, UL 1973 and UL 9540/ UL 9540 A for ESS, as well as UL 1974 for second use, how to use it, and the value and the requirements from higher level standards, like NFPA and IFC.



14-15 MAY 2024 | STRASBOURG, FRANCE

# GRID-SCALE ENERGY STORAGE EUROPE

Overcoming the Hurdles to a Renewable & Sustainable Future

Co-Located Event

## 14:45 MODERATED Q&A: Session Wrap-Up

Moderator: Sam Jaffe, Business Development Senior Manager, Addionics

Panelists:

Karolis Kiguolis, Founder, Exigere Responsum

Matthias Vetter, PhD, Department Head, Electrical Energy Storage, Fraunhofer Institute for Solar Energy Systems ISE

Thomas Fedderau, Senior Product Manager, EIA, UL International Germany

## 15:05 Refreshment Break in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

## 15:30 SineStack—Taking Energy Efficiency & Cycle Life to the Next Level

Wasim Sarwar Dilov, PhD, Head of Research & Advanced Engineering, Rimac

The Sinestack is a technological powerhouse, incorporating a novel electrical architecture, state-of-the-art cells and a suite of battery intelligence tools to create a cutting edge all-in-one stationary energy storage and power delivery system. This talk will provide insights into the broad array of technical innovations enabling these attributes.

## 15:50 Successful Efficient Energy and E-Mobility Transition

Claudio Geyken, CEO & Founder, RiDERgy

## 16:10 Sponsored Presentation (Opportunity Available)

## 16:30 MODERATED Q&A: Session Wrap-Up

Moderator: Sam Jaffe, Business Development Senior Manager, Addionics

Panelists:

Wasim Sarwar Dilov, PhD, Head of Research & Advanced Engineering, Rimac

Claudio Geyken, CEO & Founder, RiDERgy

## 16:50 Networking Reception in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

## 18:00 Close of Day

### WEDNESDAY 15 MAY

## 7:20 Registration Open

## 7:30 Interactive Breakout Discussions & Morning Coffee

Interactive Breakout Discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

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### TABLE 6: Benefits of Wireless Communication Technology in Battery Management Systems

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## TABLE 11: Advances in Sodium-ion Battery Materials

Moderator: Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin

## INNOVATION IN GRID-SCALE ENERGY STORAGE

### 9:05 Chairperson's Remarks

Chloe Herrera, Energy Storage Analyst, Lux Research

### 9:10 Beyond Performance Data: Evaluating Potential Safety Concerns of Alternative Cell Designs in Energy Storage Systems through a Testing Based Approach

Troy Hayes, PhD, Principal Engineer, Materials & Corrosion Engineering, Exponent

The continued demand for higher battery performance and lower costs has resulted in the development of larger, less-established cell designs. These alternative cell designs, however, can pose unexpected safety concerns. In this talk, we will describe common pitfalls related to cell design and manufacturing quality control, as observed through X-ray screening, computed tomography scanning, teardown analysis, and abuse testing, and will discuss lessons learned.

### 9:30 Energy Storage: Battery Chemistry and Technology Trends

Iola Hughes, Research Manager, Rho Motion

The stationary storage market was the fastest growing battery market in 2023, exceeding 100GWh. The session will look to address several key questions: What are the biggest opportunities and challenges for the stationary storage market? What is the outlook for sodium ion, flow batteries and other alternative tech? Who are the key players in the BESS market and what new technologies are being deployed in the space?

### 9:50 Battery Energy Storage Supply Chain: Trends, Risks, and Recommendations

Kevin Shang, Senior Research Analyst, Battery and Energy Storage Technology and Supply Chain, Wood Mackenzie

Grid energy storage is on a rapid growth curve and is already a key component of building a resilient grid that accommodates increasing renewables. However, supply chain issues have become a barrier, constraining energy storage deployment. This talk will also explore the supply challenges and market opportunities that arise while establishing secure and sustainable supply chains for energy storage, taking into account government energy policy, legislation and decarbonization strategy.

## 10:10 Sponsored Presentation (Opportunity Available)

### 10:30 MODERATED Q&A: Session Wrap-Up

Moderator: Chloe Herrera, Energy Storage Analyst, Lux Research

Panelists:

Troy Hayes, PhD, Principal Engineer, Materials & Corrosion Engineering, Exponent

Iola Hughes, Research Manager, Rho Motion

Kevin Shang, Senior Research Analyst, Battery and Energy Storage Technology and Supply Chain, Wood Mackenzie

### 10:50 Coffee Break in the Exhibit Hall with Poster Viewing

(Sponsorship Opportunity Available)

### 11:20 Utility-Scale Li-ion Battery Energy Storage Systems

Sonia Leou, Sales Engineer, Utility Scale Energy Storage, Fluence

With the growing interest and demand in power generation from sustainable energy sources, energy storage is getting more attention around the globe. It's also essential to build resilient, reliable, and affordable electricity grids that can handle the variable nature of renewable energies. Therefore, this is where BESS (battery energy storage system) steps in, rechargeable batteries that can store energy from different sources and discharge it when needed.



14-15 MAY 2024 | STRASBOURG, FRANCE

# GRID-SCALE ENERGY STORAGE EUROPE

Overcoming the Hurdles to a Renewable & Sustainable Future

Co-Located Event

## **11:40 Analyzing the Growing Need for Energy Storage in Industrial Applications: Implications for Sustainability, Resilience, and Technological Advancements**

*Bernhard Riegel, Director, R&D, HOPPECKE Batterien GmbH & Co. KG*

The presentation illuminates the overall technological maturity of industrial energy storage, focusing on their main application areas in terms of sustainability and circular economy. It discusses approaches for developing new technologies and the electrochemical storage technologies that are expected to dominate in 2030, aiming to achieve the goal of climate neutrality by 2050.

## **12:00 Sponsored Presentation** *(Opportunity Available)*

### **12:20 MODERATED Q&A: Session Wrap-Up**

*Moderator: Chloe Herrera, Energy Storage Analyst, Lux Research*

*Panelists:*

*Sonia Leou, Sales Engineer, Utility Scale Energy Storage, Fluence*

*Bernhard Riegel, Director, R&D, HOPPECKE Batterien GmbH & Co. KG*

## **12:40 Networking Lunch** *(Sponsorship Opportunity Available)*

## **14:00 Dessert Break in the Exhibit Hall with Poster Viewing**

*(Sponsorship Opportunity Available)*

## **14:30 Close of Conference**



15-16 MAY 2024 | STRASBOURG, FRANCE

# LITHIUM BATTERY CHEMISTRY — PART 2

Advancements in Lithium-ion and Beyond

## WEDNESDAY 15 MAY

**12:30 Registration Open**

**12:40 Networking Lunch** (Sponsorship Opportunity Available)

**14:00 Dessert Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

### SOLID STATE

**14:30 Organizer's Remarks**

*Victoria Mosolgo, Conference Producer, Cambridge EnerTech*

**14:35 Chairperson's Remarks**

*Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

**14:40 New Perspective on Anode-Free All-Solid-State Batteries**

*Shirley Meng, PhD, Professor, University of Chicago; Chief Scientist, Argonne Collaborative Center for Energy Storage Science, Argonne National Laboratory*

Anode-free strategy is gaining more interest in recent years, due to its manufacturing simplicity and potential for high-energy-density batteries without safety compromise. However, the design constraints for anode-free batteries have been difficult to overcome. In this talk, I will give an update on our efforts to enable anode-free lithium-metal and anode-free sodium-metal batteries. We hope to discuss a few opportunities presented by such a strategy.

**15:00 Advanced Electrolytes for Metal Batteries**

*Venkataraman Thangadurai, PhD, Professor, Chemistry, University of Calgary*

I would like to present recent advances in solid-state membranes for intercalation electrodes and also conversion electrodes, especially sulfur cathodes. Li-stuffed garnets and sodium silicates for next-generation batteries will be discussed.

**15:20 Blue Solutions' Strategy for Developing an Agnostic New Polymer Electrolyte**

 Blue Solutions

*Margaud Lecuyer, Electrochemical Engineer, Production Monitoring, Blue Solutions*

Blue Solutions is already known as the pioneer company in the field of solid-state batteries, having put on the market Lithium Metal Polymer batteries since 2011. Currently, we are preparing next generation by developing a new electrolyte chemistry that is compatible with multiple cathode materials. The aim of this strategy? Anticipating possible market shifts due to either lack of mineral resources or OEMs wish to move to greener products in a medium time.

**15:40 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up**

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Shirley Meng, PhD, Professor, University of Chicago; Chief Scientist, Argonne Collaborative Center for Energy Storage Science, Argonne National Laboratory*

*Venkataraman Thangadurai, PhD, Professor, Chemistry, University of Calgary*  
*Margaud Lecuyer, Electrochemical Engineer, Production Monitoring, Blue Solutions*

**16:00 Refreshment Break in the Exhibit Hall with Poster Viewing**

(Sponsorship Opportunity Available)

**16:30 Solid-State Batteries**

*Juergen Janek, PhD, Professor, Solid-State Ionics & Electrochemistry, Justus Liebig University, Giessen*

In this presentation, the current status of sulfide-based SSBs and the recent development of halide solid electrolytes will be briefly discussed, as well as the potential need for targeted design of cathode active materials for SSBs.

**16:50 Oxide-Based Solid-State Batteries**

*Olivier Guillon, Professor & Director, Materials Synthesis & Processing, Forschungszentrum Juelich GmbH*

This overview presentation will highlight the recent developments related to the integration of oxide electrolytes into lithium solid-state batteries within the Festbatt dedicated platform. In particular, synthesis with low carbon-footprint and energy-efficient processing are important for this class of materials. Thick and thin film technologies as well as innovative sintering approaches are key to guarantee materials compatibility and functionality.

**17:10 The Future of Polymer Electrolytes in EV Applications**

*Gunther Brunklaus, PhD, Group Leader, Ionics in Energy Storage, IEK 12, Forschungszentrum Juelich*

Fast-charge capabilities of solid-state batteries enable their application in future electric cars and long-distance trucks. In this talk, we discuss candidate polymer electrolytes for lithium-metal batteries that can be processed and operated at moderate temperatures, while affording long cycle-life and high electrochemical stability. Synergistic performance improvements are demonstrated in hybrid cells with inorganic materials that allow for straightforward cell assembly; also, relevant aspects of cell designs are addressed.

**17:30 MODERATED Q&A: Session Wrap-Up**

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Juergen Janek, PhD, Professor, Solid-State Ionics & Electrochemistry, Justus Liebig University, Giessen*

*Olivier Guillon, Professor & Director, Materials Synthesis & Processing, Forschungszentrum Juelich GmbH*

*Gunther Brunklaus, PhD, Group Leader, Ionics in Energy Storage, IEK 12, Forschungszentrum Juelich*

**17:50 Networking Reception in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

**19:00 Close of Day**

## THURSDAY 16 MAY

**8:00 Registration and Morning Coffee**

### SOLID STATE

**8:40 Organizer's Remarks**

*Victoria Mosolgo, Conference Producer, Cambridge EnerTech*

**8:45 Chairperson's Remarks**

*Juergen Janek, PhD, Professor, Solid-State Ionics & Electrochemistry, Justus Liebig University, Giessen*

**8:50 Presentation to be Announced**



**9:10 Solid-State Batteries**

*Linda F. Nazar, PhD, Professor Chemistry & Canada Research Chair, Solid State Energy Materials, University of Waterloo*

**9:30 SOLBAT: The Solid-State Metal-Anode Battery Project within The Faraday Institution**

*Mauro Pasta, PhD, Associate Professor, Materials, University of Oxford*

The SOLBAT project within The Faraday Institution, the UK's independent institute for electrochemical energy storage science and technology, aims to understand the fundamental science underpinning the manifold scientific and technological challenges to the practical development of solid-state batteries. In my presentation, I will summarize the scientific highlights from the SOLBAT project and the overall scientific direction.



15-16 MAY 2024 | STRASBOURG, FRANCE

# LITHIUM BATTERY CHEMISTRY — PART 2

Advancements in Lithium-ion and Beyond

## 9:50 Design Factors for Halide- and Sulfide-Based Solid-State Batteries

*Yoon Seok Jung, PhD, Professor, Energy Storage Materials and Electrochemistry, Yonsei University*

Recent advancements in all-solid-state batteries (ASSBs) have marked a significant leap forward. Mechanically sinterable sulfide solid electrolytes (SEs) are pivotal for the scalable fabrication of ASSBs. Additionally, the emergence of halide SEs, noted for their high oxidative stability, has opened new avenues. This presentation discusses material design factors for enhancing ionic conductivity, electrochemical stability, and compatibility between SEs, as well as engineering aspects associated with cell fabrication.

## 10:10 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Juergen Janek, PhD, Professor, Solid-State Ionics & Electrochemistry, Justus Liebig University, Giessen*

*Panelists:*

*Linda F. Nazar, PhD, Professor Chemistry & Canada Research Chair, Solid State Energy Materials, University of Waterloo*

*Mauro Pasta, PhD, Associate Professor, Materials, University of Oxford*

*Yoon Seok Jung, PhD, Professor, Energy Storage Materials and Electrochemistry, Yonsei University*

## 10:30 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## 11:00 Li-Free Anode Battery Development and Scaling at QuantumScape

*Tim Holme, PhD, CTO, QuantumScape Battery Corporation*

This talk will highlight the scientific and engineering challenges in developing and scaling production of an anode-free solid-state battery. QuantumScape was founded in 2010, with a mission to revolutionise energy storage to enable a sustainable future.

## 11:20 Cost-Optimised Designs for EVs: Status and Outlook for Mn-Rich Systems—Offering NMC-like Energy Density at LFP-like Cost

*Stephane Levasseur, PhD, Senior Director Innovation Battery, Umicore*

The ongoing race towards more affordable vehicles, translated into lower US/kWh, sheds a new light on these materials which appear to be very suitable candidates for cost-optimised designs. Topics covered: presenting Umicore, global leader in active battery materials; cathode material roadmap for xEV: which chemistries for which applications? Focus on Mn-rich compounds: how can they answer today's needs? Progress made in the technical development Mn-rich.

## 11:40 Presentation to be Announced by Coreshell Technologies

## 12:00 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Juergen Janek, PhD, Professor, Solid-State Ionics & Electrochemistry, Justus Liebig University, Giessen*

*Panelists:*

*Tim Holme, PhD, CTO, QuantumScape Battery Corporation*

*Stephane Levasseur, PhD, Senior Director Innovation Battery, Umicore*

## 12:20 Networking Lunch (Sponsorship Opportunity Available)

## 13:00 Dessert Break in the Exhibit Hall with Last Chance for Poster Viewing (Sponsorship Opportunity Available)

## SOLID STATE

### 13:30 Chairperson's Remarks

*Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

### 13:35 Design Strategies for Anodes and Interface toward High-Energy and Long-Lasting Quasi-All-Solid-State Lithium Batteries Employing Garnet Solid Electrolytes

*Jusik Kim, PhD, Principal Researcher, Samsung Advanced Institute of Technology*

In this presentation, we will discuss anode design strategies for introducing a carbon-based interlayer, from the perspective of reducing the interfacial resistance and preventing short-circuit formation via experimental measurements and computational modelling.

### 13:55 All-Climate Solid-State Battery Enabled by Non-Flammable Gel Polymer Electrolyte

*Zhe Li, PhD, Senior Researcher, China Science Lab, General Motors*

Solid-state battery (SSB) is a potentially superior alternative to a state-of-the-art lithium-ion battery, owing to its merits in abuse tolerance, operable temperature ranges, and system integration. Though promising, SSBs still face barriers that hinder their practical application, such as insufficient physical contact and poor ionic transport. In this talk, we will propose the strategies of utilising gel polymer electrolytes to effectively enhance the interfacial compatibility.

### 14:15 Saft's Advanced & beyond Lithium-ion Technologies for Mobility Applications

*Patrick Bernard, PhD, Director, Research, SAFT*

Saft is developing new Li-ion products reflecting market needs: LTO cell for heavy-cycling applications, phosphate-based technology for safety-critical applications, NMC/Gr-Si-based cells for high-energy applications. Future materials will allow the development of next generations of Li-ion technologies: HV phosphates, LNMO, Li-rich rocksalts, and titanium niobium oxide. Beyond conventional Li-ion batteries, Saft has launched a large program of R&D and industrialisation on solid-state technologies.

### 14:35 MODERATED Q&A: Session Wrap-Up

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Jusik Kim, PhD, Principal Researcher, Samsung Advanced Institute of Technology*

*Zhe Li, PhD, Senior Researcher, China Science Lab, General Motors*

*Patrick Bernard, PhD, Director, Research, SAFT*

### 14:55 Session Break

### 15:10 Presentation to be Announced by E magy

### 15:30 Making Cobalt-Free Lithium/Manganese-Rich Cathodes Work: Stable, Safe, High-Capacity CAM Made by Stratus Materials

*Ian Matts, PhD, Director, Product Development, Stratus Materials*

This talk will cover the development of LXMO, a new class of Lithium/Manganese (LMR) cathode material by Stratus Materials. The presentation will be data-intensive and show how this material succeeds in common full cell testing configurations as a compelling solution. We will focus on durability and safety performance as well as energy density.

### 15:50 Next-Generation Batteries (Silicon, Lithium-Metal, Sulphur): Status Update

*Nicolo Campagnol, PhD, Solution Manager, Battery Insights, McKinsey & Co.*

This talk aims to create more clarity about next-generation Li-ion chemistries in terms of what they are and what their industrialization status is.

### 16:10 MODERATED Q&A: Session Wrap-Up

*Moderator: Martin Winter, PhD, Director & Professor, Electrochemical Energy Technology, University of Muenster*

*Panelists:*

*Ian Matts, PhD, Director, Product Development, Stratus Materials*

*Nicolo Campagnol, PhD, Solution Manager, Battery Insights, McKinsey & Co.*

### 16:30 Close of Conference



15-16 MAY 2024 | STRASBOURG, FRANCE

# xEV BATTERY TECHNOLOGY, APPLICATION, AND MARKET

Driving the Future  
Growth of Electric  
Vehicles Globally

## WEDNESDAY 15 MAY

**12:30 Registration Open**

**12:40 Networking Lunch** (Sponsorship Opportunity Available)

**14:00 Dessert Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

## MARKET EXPANSION OF xEVs AND THEIR BATTERIES

**14:30 Organizer's Remarks**

*Craig Wohlers, Executive Director, Conferences, Cambridge EnerTech*

**14:35 Chairperson's Remarks**

*Arnold Lamm, PhD, Founder & Executive Director, E-Mobility, e-Technologies GmbH*



### 14:40 KEYNOTE PRESENTATION: Porsche's New Battery Advancements for the Taycan and Macan BEVs

*Otmar Bitsche, PhD, Director, E-Mobility, Porsche AG*

Porsche as leader in fast-charging and 800V technology introduces two new EVs in 2024. The Taycan shows significant steps ahead in range, efficiency, power, and fast-charging. This was enabled by new developments in cell technology, thermal management, and operating strategy. The complete new all-electric Macan, based on the PPE platform, brings 800V high power and fast-charging technology to the high-volume model at Porsche.



### 15:00 KEYNOTE PRESENTATION: Battery Technologies for Automotive Applications—Trends and Challenges

*Kurt Vandeputte, Manager Battery Cell Competence Center, BMW Group*

### 15:20 Proven Reliability of TotalEnergies Immersion Cooling Technology in Application

*Gerard Quoirin, TotalEnergies Lubricants*

Immersion cooling is a technology that enables ultra-fast charging of lithium batteries and provides an unprecedented level of safety. Using fluids developed by TotalEnergies, we will demonstrate the maturity of this concept through concrete examples.



### 15:40 MODERATED Q&A: Session Wrap-Up

*Moderator: Arnold Lamm, PhD, Founder & Executive Director, E-Mobility, e-Technologies GmbH*

*Panelists:*

*Otmar Bitsche, PhD, Director, E-Mobility, Porsche AG*

*Kurt Vandeputte, Manager Battery Cell Competence Center, BMW Group*

*Gerard Quoirin, TotalEnergies Lubricants*

**16:00 Refreshment Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

### 16:30 Sustainability and Affordability—Requirements for Future Mobility, Electrification, and Batteries

*Roland Matthé, Technical Fellow, Global Battery Systems; Manager, Electrical Architecture, Stellantis*

Stellantis is a global vehicle manufacturer based on companies in automotive business since 1896. The company is pushing forward the transformation of automotive mobility towards sustainability with a special focus on keeping mobility affordable. Electrification of the portfolio is progressing and requires battery solutions which have to meet two key goals, sustainability and affordability.

### 16:50 Fast Charge Innovation – an Example of 3-Way Partnership in Research & Advanced Engineering Aiming Toward Technology Readiness

*Pierre Tran-Van, PhD, Scientist, Renault SAS*

One of the enablers of mass EV adoption is the increase in C-rate charge capability, usually at the expense of energy density and durability. This presentation will share some steps of a collaboration featuring the dominant-silicon anode from Enevate thanks to a partnership with LGES.

### 17:10 Preparation for the Near-Future: Market & Technical Planning of the Asian xEV LIB Manufacturers

*Mark H. L. Lu, PhD, Senior Industrial Analyst, Industrial Economics & Knowledge Center, Industrial Technology Research Institute*

This presentation will provide an overview of the above cell-makers' planning, especially covering both the technical comparison, market, and product segmentation to show the future development in Asian xEV LIB manufacturers.

### 17:30 MODERATED Q&A: Session Wrap-Up

*Moderator: Arnold Lamm, PhD, Founder & Executive Director, E-Mobility, e-Technologies GmbH*

*Panelists:*

*Roland Matthé, Technical Fellow, Global Battery Systems; Manager, Electrical Architecture, Stellantis*

*Pierre Tran-Van, PhD, Scientist, Renault SAS*

*Mark H. L. Lu, PhD, Senior Industrial Analyst, Industrial Economics & Knowledge Center, Industrial Technology Research Institute*

**17:50 Networking Reception in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

**19:00 Close of Day**

## THURSDAY 16 MAY

**8:00 Registration and Morning Coffee**

## MARKET EXPANSION OF xEVs AND THEIR BATTERIES

**8:45 Chairperson's Remarks**

*Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric*

### 8:50 100% silicon anodes enable higher energy density, improved safety, and faster charging xEV Li-ion cells

*Robert Anstey, CEO, GDI*

Most silicon-carbon Li-ion cells contain >50% graphite anode active material. Many of these blends have serious supply chain risks, safety concerns, and calendar life issues. EV pack space and weight must be increased to enhance safety and thermal management to make these cells less dangerous and speed up charging. GDI solves this in the cell by replacing all graphite, binder, and carbon in the anode with low surface area silicon to increase energy density, safety, and fast charging speeds.



### 9:10 Introduction to the Premium Platform Electric (PPE) Battery System

*Sebastian Lacher, PhD, Head, Cell & Cell Module Development, E Traction HV Systems Development, Audi AG*

Audi and Porsche will launch their first vehicles on the Premium Platform Electric to market. This talk will introduce key features such as fast charging and thermal management from cell up to system-level.





15-16 MAY 2024 | STRASBOURG, FRANCE

# xEV BATTERY TECHNOLOGY, APPLICATION, AND MARKET

Driving the Future  
Growth of Electric  
Vehicles Globally

## xEV BATTERY TECHNOLOGY

### 9:30 Wildcat U.S. Manufacturing Plans for Advanced Cathode Materials

*Dee Strand, PhD, CSO, R&D, Wildcat Discovery Technologies, Inc.*

The intersection of Wildcat Discovery Technologies' materials experience with the U.S. goal of a domestic supply chain provides a unique opportunity. We will describe Wildcat's plan and progress to manufacture advanced cathode materials. Our product pipeline consists of materials that 1) provide a range of energy densities; 2) are free of cobalt and nickel; 3) show promising material safety performance; and 4) have synergies in manufacturing unit operations.

### 9:50 Deployment and Demonstration of Enevate Ultra-Fast Charging Cells

*Benjamin Park, PhD, Founder & CTO, Enevate Corp.*

Ultra-fast charging is the last hurdle to widespread EV adoption. Charging as fast as filling a tank is a clear objective for vehicle and battery makers alike. Enevate will update its progress in enabling this goal, including results showing all-silicon fast-charging cells in different form factors. Enevate will also update progress in commercialisation and practical demonstration of its cell technology. Updates will also be given on Enevate's computational (AI) tools.

### 10:10 MODERATED Q&A: Session Wrap-Up

*Moderator: Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric*

*Panelists:*

*Sebastian Lacher, PhD, Head, Cell & Cell Module Development, E Traction HV Systems Development, Audi AG*

*Dee Strand, PhD, CSO, R&D, Wildcat Discovery Technologies, Inc.*

*Benjamin Park, PhD, Founder & CTO, Enevate Corp.*

*Robert Anstey, CEO, GDI*

### 10:30 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

### 11:00 Multi-Chemistry Battery Electric Platforms—A Technological Differentiator

*Joern Neuhausen, PhD, Director, PwC Strategy*

The diversification of electric platforms will determine the next phase in eMobility transformation. To meet diverse relevant customer needs, future BEV powertrain requires differentiated platforms, mainly driven by battery and cell technology. Multi-chemistry powertrain platforms will play a pivotal role, enabling OEM and suppliers to introduce innovation across classes and build competitive advantages across range, charging speed, and costs.

### 11:20 How Safety Regulations and Battery Pack Design Trends Drive Venting Unit Innovation

*Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

Battery pack safety concepts are essential to ensure trust in battery technology and to comply with battery safety regulations. New battery cell chemistries and pack designs require differentiated safety concepts, driving the need for adapted venting units which play an important role in reducing the negative impact of thermal runaways. This presentation will provide an overview of current challenges and solutions for multi-functional venting units—beyond just gas release.

### 11:40 Presentation to be Announced



### 12:00 MODERATED Q&A: Session Wrap-Up

*Moderator: Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric*

*Panelists:*

*Joern Neuhausen, PhD, Director, PwC Strategy*

*Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

### 12:20 Networking Lunch *(Sponsorship Opportunity Available)*

### 13:00 Dessert Break in the Exhibit Hall with Last Chance for Poster Viewing *(Sponsorship Opportunity Available)*

## xEV BATTERY TECHNOLOGY

### 13:30 Chairperson's Remarks

*Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

### 13:35 Securing the Competitiveness of the European Battery Industry in a Changing World

*Ilka Von Dalwigk, Policy Manager, European Battery Alliance*

The EU battery industry is under pressure. Recent geopolitical challenges hamper the investment climate and its competitiveness. The work started by the European Battery Alliance to stay ahead of competitors will only succeed if decision-makers acknowledge the change of paradigm in global trade and embrace the changed rules of the game. It is therefore paramount that industry and policy-makers act jointly to complete and future-proof the EU's regulatory toolbox.

### 13:55 Increasing Battery System Performance

*Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric*

Battery systems are complex systems with the battery cell as the core technology of the system, but then integrated with multiple subsystems, including mechanical, thermal, and battery management systems (BMS). This presentation will look into the different subsystems that contribute to the overall battery system performance and opportunities for improvement in next-generation battery systems. Battery system trends in the industry will be evaluated and discussed.

### 14:15 Dynamic Crash Research of HV Batteries with a Drop Tower

*Roland Weixler, Managing Director, KE TEC GmbH*

Today different crush tests are defined, with the disadvantage to observe only the local damage by the intrusion. By contrast, dynamic tests stress the whole battery. In order to protect the crash center from unexpected events, it could be interesting to crash the battery system with a drop tower. A further advantage is that the whole battery will be monitored with a high-speed 3D measurement system during the crash.

### 14:35 MODERATED Q&A: Session Wrap-Up

*Moderator: Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

*Panelists:*

*Ilka Von Dalwigk, Policy Manager, European Battery Alliance*

*Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric*

*Roland Weixler, Managing Director, KE TEC GmbH*

### 14:55 Session Break

### 15:10 Trends and Developments in Battery Performance

*Aslan Goeger, Director Business Development, Farasis Energy Europe GmbH*



Offering high energy density whilst ensuring fast charging will be a key milestone for future success in the automotive industry, combined with the ability to deliver demanded volumes in-time. Aslan Goeger, Director Business Development at Farasis Energy Europe, explains in his presentation, how the organization will tackle these challenges based on high performance lithium-ion batteries and will give an insight into latest battery developments.

### 15:30 Scalable Dry Coating of Battery Electrodes with DRYtraec

*Benjamin Schumm, PhD, Division Manager, Battery Technology, Fraunhofer IWS*

The proprietary dry coating technology DRYtraec enables solvent-free battery electrode coating with significant cost reduction potential. Results of the application of this technology for the production of electrodes for LIB (NMC, LFP, Graphite), Li-S, and SSB at a prototype scale (20cm wide tandem coatings at 10m/min) will be presented.

## **15:50 Empowering Electric Vehicle Battery Testing: Conquering Data Challenges for Enhanced Safety and Performance**

*Penny Merian, Director, Go To Market, Product Analytics, National Instruments*

Testing electric vehicle (EV) batteries guarantees their safety, performance, and durability. Nonetheless, EV battery testing confronts a range of data-related challenges. Join us to explore the significance of tackling these challenges within EV battery testing as it becomes pivotal in the "shift left" paradigm, ultimately enhancing the overall performance of batteries.

## **16:10 MODERATED Q&A: Session Wrap-Up**

*Moderator: Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

*Panelists:*

*Benjamin Schumm, PhD, Division Manager, Battery Technology, Fraunhofer IWS*

*Penny Merian, Director, Go To Market, Product Analytics, National Instruments*

*Aslan Goeger, Director Business Development, Farasis Energy Europe GmbH*

## **16:30 Close of Conference**



15-16 MAY 2024 | STRASBOURG, FRANCE

# GLOBAL BATTERY RAW MATERIALS

Balancing Supply, Demand, and Costs for Battery Component Materials

## WEDNESDAY 15 MAY

**12:30 Registration Open**

**12:40 Networking Lunch** (Sponsorship Opportunity Available)

**14:00 Dessert Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

## GLOBAL MARKET DEMAND

**14:30 Organizer's Remarks**

*Craig Wohlers, Executive Director, Conferences, Cambridge EnerTech*

**14:35 Chairperson's Remarks**

*Lukasz Bednarski, Associate Director, Battery Raw Materials, IHS Markit*

**14:40 EV Sales Review for 2023 and the Expectations Going Forward and Implications on Battery Demand**

*Viktor Irle, Co-Founder & Market Analyst, EV Volumes*

**15:00 Outlook for Battery Raw Materials**

*Olivier Masson, Metals and Mining Analyst, Fastmarkets*

This presentation will cover recent developments in the markets for major battery raw materials, particularly lithium, nickel, and cobalt. The presentation will also give an outlook on the supply and demand for these raw materials and highlight any issues that could affect the price for these commodities in the years ahead.

**15:20 Sustainably Sustainable Production Processing of Cathode Active Material**

*Wyatt Olson, Sr. Program Manager, 6K Energy*

The process for producing battery material must change to create a long-term ecosystem in the US. It must be cost-effective and environmentally friendly, thus sustainably sustainable. Requiring a process that is energy efficient, produces no waste, and can reuse virtually all byproducts by returning them to the feedstock supply for future battery material. Learn how we are leveraging nitric acid to eliminate sodium sulfate waste and create a sustainable, circular process.



**15:40 MODERATED Q&A: Session Wrap-Up**

*Moderator: Lukasz Bednarski, Associate Director, Battery Raw Materials, IHS Markit*

*Panelists:*

*Viktor Irle, Co-Founder & Market Analyst, EV Volumes*

*Olivier Masson, Metals and Mining Analyst, Fastmarkets*

*Wyatt Olson, Sr. Program Manager, 6K Energy*

**16:00 Refreshment Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

**16:30 Lithium in the Terawatt-Hour Era**

*Adam Megginson, Analyst, Benchmark Mineral Intelligence*

After closely tracking and analysing a tumultuous 12 months for the lithium market, what lessons can we learn? What does the remainder of 2024 have in store for supply & demand, and how will this affect prices for this specialty chemical so vital to electrification?

**16:50 Risks to the European Battery Raw Materials Supply Chain**

*Alex Laugharne, Principal Consultant, Consulting, CRU International*

Massive investment in European LIB capacity is resulting in rapid growth in raw and active materials requirements. In-region availability of raw material resources is limited; the build-out of refining and active materials capacity remains incipient. This presentation will highlight the scale of the challenge meeting regional demand for low-cost, low-carbon, and responsibly-sourced raw materials; incorporating supply-demand balance scenarios, company and regulatory responses, and risks to key players.

**17:10 China Lithium Battery Market Update**

*Jared Zhu, Senior Consulting Project Manager, Shanghai Metals Market*

Rapid growth of global lithium-ion battery demand, geopolitical factors, and technological development have a great impact on the lithium-ion battery industry, specifically on raw materials. Heavy investment in the raw materials sector could lead to overcapacity once EV sales' growth is lower than expected. Different types of batteries also could reduce dependency on certain raw materials. Huge fluctuation in raw-materials prices could deeply damage the battery industry and beyond.

**17:30 MODERATED Q&A: Session Wrap-Up**

*Moderator: Lukasz Bednarski, Associate Director, Battery Raw Materials, IHS Markit*

*Panelists:*

*Adam Megginson, Analyst, Benchmark Mineral Intelligence*

*Alex Laugharne, Principal Consultant, Consulting, CRU International*

*Jared Zhu, Senior Consulting Project Manager, Shanghai Metals Market*

**17:50 Networking Reception in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

**19:00 Close of Day**

## THURSDAY 16 MAY

**8:00 Registration and Morning Coffee**

## GLOBAL MARKET DEMAND

**8:45 Chairperson's Remarks**

*Alex Laugharne, Principal Consultant, Consulting, CRU International*

**8:50 Sustainable CNT Manufacturing to Meet Global Demand for High-Performance, Low-Cost Carbon Nanotubes**

*David Arthur, CEO, CHASM Advanced Materials*

With Carbon nanotubes (CNTs) becoming critical for today's EV batteries, sustainable, scalable approaches to meet expected global demand are needed, including US and European production. In the past, commercial application has been hindered by the practical obstacles of scaling manufacturing at viable cost. In this talk, we'll present CHASM's unique approach, which produces low-cost, tunable and high purity CNT materials and we'll share performance results and expansion plans.



**9:10 Unconventional Lithium Resources & Extraction Methods**

*Lukasz Bednarski, Associate Director, Battery Raw Materials, IHS Markit*

The presentation based on the new research report provides an overview of novel extraction methods from unconventional lithium deposits. It provides risk analysis of unconventional lithium extraction methods and explores their impact on supply and demand forecast. The presentation also highlights the importance of novel extraction methods for regionalisation of battery supply chain and sustainability.

## SUPPLY CHAIN SUSTAINABILITY

**9:30 Sustainable Lithium Supply—SQM at the Forefront of Transparent Mining Assurance**

*Stefan Debruyne, Director of External Affairs, SQM International*

Lithium is an essential element in the global energy transition. It's critically important to stakeholders that it is mined in a sustainable and equitable way. Besides an update on SQM's progress on its sustainable development plan, SQM's innovation roadmap toward water-neutral lithium production will be presented. Additionally, global lithium demand and SQM's expansion plan will be updated.



15-16 MAY 2024 | STRASBOURG, FRANCE

# GLOBAL BATTERY RAW MATERIALS

Balancing Supply, Demand, and Costs for Battery Component Materials

## 9:50 Energizing Europe's Eco-Friendly Mobility: Selecting the Ideal CAM Materials for an Environmentally Sound Supply Chain Aligned with OEMs' Sustainability Goals

*Tom Van Bellinghen, Vice President, Marketing & OEM Value Chain, Rechargeable Battery Materials, Umicore*

In this presentation, we'll explore the critical role of carefully choosing CAM (cathode active materials) to power Europe's sustainable mobility transformation. We'll delve into the selection of different chemistries, each with their own performance profile and ramp-up challenges. We'll also highlight their vital role in constructing a supply chain that meets the stringent sustainability standards set by original equipment manufacturers (OEMs).

## 10:10 MODERATED Q&A: Session Wrap-Up

*Moderator: Alex Laugharne, Principal Consultant, Consulting, CRU International*  
*Panelists:*

*Lukasz Bednarski, Associate Director, Battery Raw Materials, IHS Markit*

*Stefan Debruyne, Director of External Affairs, SQM International*

*Tom Van Bellinghen, Vice President, Marketing & OEM Value Chain, Rechargeable Battery Materials, Umicore*

*David Arthur, CEO, CHASM Advanced Materials*

## 10:30 Coffee Break in the Exhibit Hall with Poster Viewing

*(Sponsorship Opportunity Available)*

## BATTERY RAW MATERIALS SUPPLY



### 11:00 FEATURED PRESENTATION: Building the World's Next Tier-1 Lithium Operation, Sustainably

*Matthew Deyoe, Executive Vice President, Sigma Lithium*

## 11:20 An Update on Brazilian Nickel's Low-Carbon Piauí Nickel Project

*Anne Oxley, Technical Director, Brazilian Nickel PLC*

Brazilian Nickel's Piauí Project in NE Brazil is a nickel laterite heap leach, producing nickel- and cobalt-intermediate products as feed for battery cathodes. Small-scale production began in 2022, and construction for the full-scale project will begin in 2024. Nickel production of 25,000 tpa contained in MHP will begin in 2026. Brazilian Nickel will give an update on progress on the project, other future projects, and its CO2 reduction plans.

## 11:40 Graphene from Disperser Manufacturer Accelerates Battery Development

*Hironobu Minai, Section Manager, Sapporo R&D, JOKOH CO., LTD.*

JOKOH has developed highly customizable graphene using our ultra-high pressure homogenizer (NAGS). Free combinations of shape, lateral dimensions, layers thickness, and dispersion concentration can be possible. We show the quality assessment details based on ISO standards and comparison of battery performance with CNT and others. The products can be provided as powder, dispersion liquid, and ink mixed with other materials. We aim to contribute to significantly shortening the development period.



## 12:00 MODERATED Q&A: Session Wrap-Up

*Moderator: Alex Laugharne, Principal Consultant, Consulting, CRU International*  
*Panelists:*

*Matthew Deyoe, Executive Vice President, Sigma Lithium*

*Anne Oxley, Technical Director, Brazilian Nickel PLC*

## 12:20 Networking Lunch *(Sponsorship Opportunity Available)*

## 13:00 Dessert Break in the Exhibit Hall with Last Chance for Poster Viewing *(Sponsorship Opportunity Available)*

## BATTERY RAW MATERIALS SUPPLY

### 13:30 Chairperson's Remarks

*Anne Oxley, Technical Director, Brazilian Nickel PLC*

## 13:35 Regional Diversification in Battery Compositions and the Impact of Regional Supply-and-Demand Balance

*Jack Bedder, PhD, Founder & Director, Project Blue*

This presentation will assess how the regional variations in cathode chemistry choice by manufacturers will impact raw material requirements in major markets. The development of the supply chains in these regions will undergo different strains and stresses as regional production ramps up, with both private and government support targeting particular markets.

## 13:55 Nickel Market Outlook—Indonesian Supply Dominates

*Jason Sappor, Senior Analyst, S&P Global Commodity Insights*

We expect the global nickel market to be oversupplied in the medium term, as supply from top producer Indonesia surges. This presentation will assess the nickel market performance in 2024 and provide our five-year price forecast, considering factors including electric vehicle sales, battery chemistry mix, and supply-and-demand fundamentals.

## 14:15 Québec: A Reliable Partner for Raw Battery Minerals

*Jonathan Lafontaine, P.Geo., M.Sc., Strategic Advisor, MNRF-Quebec*

The Government of Québec published the first critical and strategic mineral plan from a Canadian province in October 2020, and in January 2023 published a revised action plan. This presentation will highlight the how Québec is taking action to become a key battery material provider from mining to processing.

## 14:35 MODERATED Q&A: Session Wrap-Up

*Moderator: Anne Oxley, Technical Director, Brazilian Nickel PLC*

*Panelists:*

*Jack Bedder, PhD, Founder & Director, Project Blue*

*Jason Sappor, Senior Analyst, S&P Global Commodity Insights*

*Jonathan Lafontaine, P.Geo., M.Sc., Strategic Advisor, MNRF-Quebec*

## 14:55 Session Break

## 15:10 Presentation to be Announced

Currently, many EV cell manufacturers have a presence in Europe, but EV components are still dependent on exports from China.

Elephantech is the first in the world to successfully mass-produce inkjet-printed circuit boards while reducing carbon emissions by 75%, copper usage by 70%, and water consumption by 95%.

This sustainable process aims to resolve geopolitical risks by establishing a production base in Europe.



## 15:30 Empowering Tomorrow: Building a Resilient Graphite Ecosystem for Sustainable Futures

*Bridget Catherine Deveney, VP Product Development and Applications, Vianode*

Battery material production, especially active anode materials, is mainly centered in Asia, posing a risk to non-Asian industries during global disruptions. Vianode counters this by manufacturing high-volume, competitive anode materials with top-tier performance in Norway, enhancing efficiency and sustainability. The presentation will touch on Vianode's progress in graphite recycling, advancing toward pilot-scale implementation.

## 15:50 Mineral-Based Raw Materials—Essential Products for Battery Safety from Cell to Pack Level

*Pia Lindorf, Head R&D Technical Services, Coatings & Electronics, Nabaltec AG*

Nabaltec AG is a leading European manufacturer offering a wide range of aluminum hydrate-based materials specially designed to serve battery safety applications like a.m. and passive heat management. To further highlight, Nabaltec has developed a new class of flame-retardant fillers to provide lightweight battery cases made of thermosets or eng. plastics with an integral heat barrier effect due to ceramification of the polymer composite.

## 16:10 MODERATED Q&A: Session Wrap-Up

*Moderator: Anne Oxley, Technical Director, Brazilian Nickel PLC*

*Panelists:*

*Bridget Catherine Deveney, VP Product Development and Applications, Vianode*

*Pia Lindorf, Head R&D Technical Services, Coatings & Electronics, Nabaltec AG*

## 16:30 Close of Conference



15-16 MAY 2024 | STRASBOURG, FRANCE

# EV MOBILITY 2030

SAE and AABC Joint Peer-Reviewed Technical Track

## WEDNESDAY 15 MAY

### 12:30 Registration Open

### 12:40 Networking Lunch *(Sponsorship Opportunity Available)*

### 14:00 Dessert Break in the Exhibit Hall with Poster Viewing *(Sponsorship Opportunity Available)*

### 14:30 Chairperson's Remarks

Marc LeDuc, Technical Content Manager, SAE International

### 14:35 Organizer's Remarks

Frank Bokulich, Product Content and Business Development Manager, SAE International

### 14:40 Numerical Approach for the Characterisation of the Venting Process of Cylindrical Cells under Thermal Runaway Conditions

Antonio Gil, Assistant Professor, Universitat Politècnica de Valencia

In this work, Computational Fluid Dynamics (CFD) are employed to predict this venting process in an LG18650 cylindrical battery. The ejection of the generated gases was considered to analyse its dispersion in the surrounding volume through a Reynolds-Averaged Navier-Stokes (RANS) approach. Initial work has focused on developing an appropriate methodology to set the proper boundary conditions that faithfully recreate these events.

### 15:00 A Comparative Analysis of Thermal Runaway Propagation in Different Modular Lithium-ion Battery Configurations

Antonio Garcia, PhD, Professor, Universitat Politècnica de Valencia

The study at the module level includes experimental validation and employs a comprehensive model considering heat transfer due to electrical performance and thermal runaway phenomena. The findings provide valuable insights into the design and operation of modular lithium-ion battery systems, guiding engineers and researchers in implementing best practices to improve safety and performance across various applications.

### 15:20 Presentation to be Announced by BTR New Energy Materials Inc

### 15:40 MODERATED Q&A: Session Wrap-Up

Moderator: Brian Engle, Manager, Business Development, Electrification, Amphenol

Panelists:

Antonio Garcia, PhD, Professor, Universitat Politècnica de Valencia

Antonio Gil, Assistant Professor, Universitat Politècnica de Valencia

### 16:00 Refreshment Break in the Exhibit Hall with Poster Viewing *(Sponsorship Opportunity Available)*

### 16:30 Simulation and Evaluation of Battery Aging in Electric Hybrid Storage Systems

Roman Moedl, Development Engineer, AVL

The extension of traction batteries from electric vehicles with supercapacitors is regularly discussed as a possibility to increase the lifetime of lithium-ion batteries as well as the performance of the vehicle drive. The objective of this work was to validate these assumptions by developing a simulation model. In addition, an economic analysis is performed to qualitatively classify the simulation results.

### 17:00 Model-Based Knowledge Management in HV Battery Development

Ibtihal Badi, Development Engineer, AVL

This paper will draw upon the tenets of the already established KM strategies in AVL High-Voltage Energy Systems Team and AI-centric paradigm tailored for the implementation of KMS within organisational frameworks. Our proposed approach serves to fortify the foundations of KM strategy by outlining the ways in which AI interfaces with existing operational procedures.

### 17:30 MODERATED Q&A: Session Wrap-Up

Moderator: Brian Engle, Manager, Business Development, Electrification, Amphenol

Panelists:

Roman Moedl, Development Engineer, AVL

Ibtihal Badi, Development Engineer, AVL

### 17:50 Networking Reception in the Exhibit Hall with Poster Viewing *(Sponsorship Opportunity Available)*

### 19:00 Close of Day

## THURSDAY 16 MAY

### 8:00 Registration and Morning Coffee

### 8:40 Organizer's Remarks

Frank Bokulich, Product Content and Business Development Manager, SAE International

### 8:45 Chairperson's Remarks

Brian Engle, Manager, Business Development, Electrification, Amphenol

### 8:50 Super EV: Powering the Future with 500-Mile Range and 1000 Horsepower

Ionel Stefan, Chief Technology Officer, R&D, Amprius Technologies

Improvements in pure silicon anodes with nanowire structures have enabled LIB energy density and specific energy performance that exceed current state-of-the-art graphite cells by 50-100%, depending on cell size. Commercialized cells have demonstrated 1,300 Wh/L and 500 Wh/Kg and have achieved 4000 W/kg power density with over 400 Wh/kg specific energy density, while maintaining cycle life compatible with aerospace, military, and other high-end applications.



### 9:10 Safety Testing of Stationary Battery Energy Systems: Overview of Standards

Natalia Lebedeva, PhD, Scientific Project Officer, Energy Storage, European Commission

### 9:50 Delving into the Technical Requirements and Systems for Full Digital Product Passports

Douglas Johnson-Poensgen, Founder & CEO, Circular

### 10:10 PANEL DISCUSSION: Session Wrap-Up

Moderator: Brian Engle, Manager, Business Development, Electrification, Amphenol

Panelists:

Ionel Stefan, Chief Technology Officer, R&D, Amprius Technologies

Natalia Lebedeva, PhD, Scientific Project Officer, Energy Storage, European Commission

Douglas Johnson-Poensgen, Founder & CEO, Circular

### 10:30 Coffee Break in the Exhibit Hall with Poster Viewing *(Sponsorship Opportunity Available)*

### 11:00 Electrifying the Future: Nickel's Role in Advancing Battery Technology and Markets

Parvin Adeli, PhD, Manager, Batteries, Nickel Institute

Batteries are the fastest growing market for nickel and the Nickel Institute (NI) is quite active in this space. This presentation provides an overview of the NI Battery Program followed by the current global EV market and the share of nickel-based battery chemistries. Furthermore, a discussion on the patent landscape and the latest technology developments is included.



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# EV MOBILITY 2030

SAE and AABC Joint Peer-Reviewed Technical Track

## 11:20 Does the Electric Behavior Sufficiently Describe Battery State of Health?

*Anna Stefanopoulou, PhD, William Clay Ford Professor of Technology, Director of the Energy Institute, University of Michigan*

Not for cases with sizeable irreversible swelling from plating or gas evolution. Dimensional changes of cells can be harbingers of poor health.

## 11:40 Road to 1000miles per Charge - 24M Innovative and Proprietary Process and Product Design Platforms



*Junzheng Chen, VP of Advanced R&D, Advanced R&D, 24M Technologies Inc*

Conventional LIB platform is struggling of energy density and cost while improving the safety. In this technical session, we will go over the unique approaches from 24M (SemiSolid, ETOP, Impervio, Eternalyte, Liforever) in addressing these current bottlenecks, including process and product design platforms and unique separator and electrolyte material to achieve higher energy density with better cost and recycling structure while dramatically improving safety performance.

## 12:00 MODERATED Q&A: Session Wrap-Up

*Moderator: Brian Engle, Manager, Business Development, Electrification, Amphenol*

*Panelists:*

*Parvin Adeli, PhD, Manager, Batteries, Nickel Institute*

*Anna Stefanopoulou, PhD, William Clay Ford Professor of Technology, Director of the Energy Institute, University of Michigan*

*Junzheng Chen, VP of Advanced R&D, Advanced R&D, 24M Technologies Inc*

## 12:20 Networking Lunch (Sponsorship Opportunity Available)

## 13:00 Dessert Break in the Exhibit Hall with Last Chance for Poster Viewing (Sponsorship Opportunity Available)

## 13:50 Chairperson's Remarks

*Marc LeDuc, Technical Content Manager, SAE International*

## 13:55 PANEL DISCUSSION: Battery Safety Standards

*Moderator: Brian Engle, Manager, Business Development, Electrification, Amphenol*

Our panel of experts will discuss the SAE/ISO battery safety standards including what is the recommended practice in design standards? In addition,

what are recommended practice testing and regulation versus standards will be covered.

*Panelists:*

*Antonio Garcia, PhD, Professor, Universitat Politècnica de Valencia*

*Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

*Kurt Vollmacher, Project Leader Worldwide Standardised Responder Information, Energy Safety*

## 14:55 Session Break

## 15:10 Sponsored Presentation (Opportunity Available)

## 15:30 PANEL DISCUSSION: European Battery Passport, Provenance, and Global Traceability Standards

*Moderator: Ilka Von Dalwigk, Policy Manager, European Battery Alliance*

As the global battery community rises to meet demand around the world, the critical key to success depends on the ability to deliver traceable, cost-effective, high-quality, safe cells at-scale. In an effort to deliver on this, our panel of experts will discuss the keys to CO2 tracking, ESG, provenance, and traceability standards in Europe versus the United States.

*Panelists:*

*Douglas Johnson-Poensgen, Founder & CEO, Circulor*

*Anna Stefanopoulou, PhD, William Clay Ford Professor of Technology, Director of the Energy Institute, University of Michigan*

*John Tintinalli, Europe General Manager, SAE International*

## 16:30 Close of Conference



15-16 MAY 2024 | STRASBOURG, FRANCE

# BATTERY INTELLIGENCE

Using Machine Learning and Artificial Intelligence to Optimise Battery Development from Materials to Manufacturing

## WEDNESDAY 15 MAY

**12:30 Registration Open**

**12:40 Networking Lunch** (Sponsorship Opportunity Available)

**14:00 Dessert Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

## MACHINE LEARNING FOR RESEARCH AND DEVELOPMENT

**14:30 Organizer's Remarks**

*Victoria Mosolgo, Conference Producer, Cambridge EnerTech*

**14:35 Chairperson's Remarks**

*Weihan Li, Research Group Leader, RWTH Aachen University*

**14:40 Machine Learning R&D at Northvolt**

*Siddharth Khullar, PhD, Director, Machine Learning, Northvolt*

Northvolt's machine learning R&D pioneers advancements in battery technology, employing sophisticated algorithms to optimise performance and enhance energy efficiency. The team focuses on pushing the boundaries of machine learning applications to drive innovation in sustainable energy storage solutions.

**15:00 Polymer Cell Development**

*Sungbin Park, PhD, Department Leader, LG Energy Solution*

**15:20 LFP Batteries: Don't Get Caught with your SOH Down**

*Tom Maull, Technical Strategy and Partnerships Manager, Elysia Battery Intelligence from Fortescue*



**15:40 MODERATED Q&A: Session Wrap-Up**

*Moderator: Weihan Li, Research Group Leader, RWTH Aachen University*

*Panelists:*

*Siddharth Khullar, PhD, Director, Machine Learning, Northvolt*

*Sungbin Park, PhD, Department Leader, LG Energy Solution*

**16:00 Refreshment Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

## BATTERY MATERIAL DEVELOPMENT

**16:30 Physics-Based Machine Learning for Battery Modelling**

*Changfu Zou, PhD, Associate Professor, Electrical Engineering, Chalmers University of Technology*

Current practices of physics-based machine learning mainly focus on data-driven surrogates generated to replace physics-based models. These models often trade accuracy for speed, but lack generalisability, adaptability, and interpretability, which are qualities crucial for optimisation and control purposes. To bridge the gap, we propose a novel machine-learning architecture—termed model-integrated neural networks—and demonstrate its successful application in modelling different batteries and electrode materials.

**16:50 Machine Learning for the Advanced Characterisation and Design of Battery Electrodes**

*Samuel J. Cooper, Senior Lecturer, Electrochemical Science & Engineering Group, Imperial College London*

In this talk, Sam will explain the various microstructural characterisation and analysis methods developed by his team, including some novel machine learning approaches. He will also propose a workflow for optimising the manufacturing parameters of these materials that use generative adversarial networks and Bayesian optimisation.

**17:10 Modelling of Solid-State Battery Materials with Machine Learning**

*Nongnuch Artrith, Assistant Professor, Materials Chemistry and Catalysis, Utrecht University*

Here, we give an overview of recent methodological advancements of ML techniques for atomic-scale modelling and materials design. We review

applications to materials for solid-state batteries, including electrodes, solid electrolytes, coatings, and the complex interfaces involved.

**17:30 MODERATED Q&A: Session Wrap-Up**

*Moderator: Weihan Li, Research Group Leader, RWTH Aachen University*

*Panelists:*

*Changfu Zou, PhD, Associate Professor, Electrical Engineering, Chalmers University of Technology*

*Samuel J. Cooper, Senior Lecturer, Electrochemical Science & Engineering Group, Imperial College London*

*Nongnuch Artrith, Assistant Professor, Materials Chemistry and Catalysis, Utrecht University*

**17:50 Networking Reception in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)

**19:00 Close of Day**

## THURSDAY 16 MAY

**8:00 Registration and Morning Coffee**

## LIFETIME PREDICTIONS

**8:40 Organizer's Remarks**

*Victoria Mosolgo, Conference Producer, Cambridge EnerTech*

**8:45 Chairperson's Remarks**

*Remus Teodorescu, PhD, Professor, IEEE Fellow, Villum Investigator, Aalborg University*

**8:50 Sponsored Presentation** (Opportunity Available)

**9:10 Battery Lifetime Prediction with Machine Learning: From Laboratory Data to Field Data**

*Weihan Li, Research Group Leader, RWTH Aachen University*

Reliable and accurate degradation prediction remains challenging due to the nonlinear nature of lithium-ion batteries that stems from internal electrochemical reactions and intrinsic parameter variability across cells. In this talk, we will introduce our current work in battery ageing trajectory prediction with machine learning with case studies of both testing data in the laboratory and large-scale field data from 60 electric vehicles.

**9:30 Smart Battery Technology for Lifetime Improvement**

*Remus Teodorescu, PhD, Professor, IEEE Fellow, Villum Investigator, Aalborg University*

Smart Battery is a novel BMS concept that brings together cells with power electronics and AI for transportation and grid storage, with significant extended lifetime and high potential for second-lifetime application. The key feature is the bypass device for cell-level load management, allowing complete balancing of SoC, SoT, and SoH, along with square pulse excitation for online impedance measurement and fault-tolerant operation AI-based health and safety management.

**9:50 Automatic Aging Prediction for Li-ion Batteries**

*Michael Hess, PhD, CEO, R&D, Batronics*

Data evaluation of battery aging matrices is very time consuming as tests from different SoC, Temp, DoD, and C-rates have to be evaluated. We show how this can be facilitated by online-based automatic aging analysis which is also used for phys. & ML aging prediction to judge remaining battery life.

**10:10 MODERATED Q&A: Session Wrap-Up**

*Moderator: Remus Teodorescu, PhD, Professor, IEEE Fellow, Villum Investigator, Aalborg University*

*Panelists:*

*Weihan Li, Research Group Leader, RWTH Aachen University*

*Michael Hess, PhD, CEO, R&D, Batronics*

**10:30 Coffee Break in the Exhibit Hall with Poster Viewing**  
(Sponsorship Opportunity Available)



15-16 MAY 2024 | STRASBOURG, FRANCE

# BATTERY INTELLIGENCE

Using Machine Learning and Artificial Intelligence to Optimise Battery Development from Materials to Manufacturing

## DIGITAL TWINS

### 11:00 AI-Based Digital Twin—Anomaly Detection and Diagnostics for HV Battery Behaviour and Performance

*Alwin Tuschkan, Project Manager, IODP, AVL List GmbH*

Automotive HV batteries are demanding a focussed effort on safety and failure prevention. Conventional methods for health monitoring fall short due to their supervised nature, relying on historical fault data. This presentation shows an innovative approach involving the implementation of an AI-based digital twin leveraging a graph neural network for unsupervised anomaly detection in fleet data. Furthermore, our approach incorporates domain knowledge to proactively prevent HV battery failure.

### 11:20 Multi-Scale Modelling of Battery Degradation and the Pathway to Battery Digital Twins

*Billy Wu, PhD, Associate Professor, Dyson School of Design Engineering, Imperial College London*

In this talk, we explore multi-scale battery degradation. At the particle level, we show how phase field fatigue models can describe fracture behaviour. Continuum-scale models can then describe how mechanical stresses are dynamically distributed through an electrode and how this changes with composite graphite-silicon electrodes. At the pack level, we explore how current heterogeneities further exacerbate this problem, and how digital twins provide a route to extend cell lifetime.

### 11:40 Advanced Battery Analytics to Eliminate Risks on Battery Health, Safety and Performance



*Jonas Keil, Tech Lead, Battery Analytics & Engineering, TWAICE Technologies GmbH*

The rapidly growing battery market in automotive applications demands eliminating risks in battery health, safety and performance. TWAICE leverages advanced battery analytics by testing and modeling in battery pre-life combined with in-life monitoring and machine learning techniques. To synergize physics-based and data-driven technologies enables generating insights into the current states of batteries and to predict those into the future.

### 12:00 PANEL DISCUSSION: MODERATED Q&A: Session Wrap-Up

*Moderator: Remus Teodorescu, PhD, Professor, IEEE Fellow, Villum Investigator, Aalborg University*

*Panelists:*

*Alwin Tuschkan, Project Manager, IODP, AVL List GmbH*

*Billy Wu, PhD, Associate Professor, Dyson School of Design Engineering, Imperial College London*

*Jonas Keil, Tech Lead, Battery Analytics & Engineering, TWAICE Technologies GmbH*

### 12:20 Networking Lunch (Sponsorship Opportunity Available)

### 13:00 Dessert Break in the Exhibit Hall with Last Chance for Poster Viewing (Sponsorship Opportunity Available)

### 13:30 Chairperson's Remarks

*Weihan Li, Research Group Leader, RWTH Aachen University*

### 13:35 Next-Generation Intelligent Battery Management System with Enhanced Safety for Transportation Electrification

*Sheldon Williamson, PhD, Professor & Canada Research Chair, Electrical & Computer & Software Engineering, University of Ontario Institute of Technology*  
Range anxiety is a key reason that consumers are reluctant to embrace electric vehicles (EVs). However, none of today's EVs allow fast charging in cold or even cool temperatures due to the risk of lithium plating, the formation of metallic lithium that drastically reduces battery life and even results in safety hazards. Here, we present an approach that enables 15-minute fast charging of Li-ion batteries at any temperature (-50 °C).

### 13:55 Data-Driven Approach for Accelerated Re-Characterization of Second-Life Batteries for Recovery and Reuse

*Mona Faraji-Niri, PhD, Assistant Professor, Energy Systems, Energy Innovation Centre, University of Warwick*

One of the main challenges of integrating the second-life battery cells is related to their re-characterisation after the first life, particularly when not enough information is shared from their first life use and storage. Here it will be discussed how the non-invasive experimental techniques such as electrochemical impedance spectroscopy (EIS) combined with machine learning (ML) techniques can support solving this challenge by accurately predicting the second-life battery's state-of-health (SoH) rapidly.

### 14:15 Battery Modelling and Data-Driven Health Estimation

*David A. Howey, PhD, Professor, Engineering Science, University of Oxford*

This talk will discuss recent research in battery modelling, focussing on diagnostics from field data, including combining of machine learning and circuit models to allow flexibility in fitting from data while retaining the transparency of physical models. It will conclude with some thoughts on how data-driven models can accelerate progress in batteries.

### 14:35 MODERATED Q&A: Session Wrap-Up

*Moderator: Weihan Li, Research Group Leader, RWTH Aachen University*

*Panelists:*

*Sheldon Williamson, PhD, Professor & Canada Research Chair, Electrical & Computer & Software Engineering, University of Ontario Institute of Technology*

*David A. Howey, PhD, Professor, Engineering Science, University of Oxford*

### 14:55 Session Break

## BATTERY DEVELOPMENT

### 15:10 Sponsored Presentation (Opportunity Available)

### 15:30 Performing Microscale Simulations of Long-Term SEI Growth in Li-ion Batteries

*Falco Schneider, PhD, Scientist, Flow and Material Simulation, Fraunhofer ITWM*

Li-ion batteries are exposed to a variety of degradation effects, causing cell aging over time. One major contributor to capacity and power fade of the cell is growth of the solid electrolyte interphase (SEI). In this talk we will discuss how the long-term growth behaviour of the SEI can be captured with fully coupled electrochemical simulations. Furthermore, we present numerical methods to enable long-term aging studies of such detailed models.

### 15:50 From Battery Development to Battery Passports: Electrochemical Insights at-Scale

*Eli Leland, PhD, CTO and Co-Founder, Voltaiq, Inc.*

From development to production to battery passports, the imperative to understand battery quality, performance, and health at every stage is clear. Rather than assemble a patchwork of siloed systems to meet these needs, companies that take an integrated, full-lifecycle approach to achieving electrochemical insights at-scale will learn faster than the competition, serve customer needs better, and ultimately win in the marketplace.

### 16:10 MODERATED Q&A: Session Wrap-Up

*Moderator: Weihan Li, Research Group Leader, RWTH Aachen University*

*Panelists:*

*Falco Schneider, PhD, Scientist, Flow and Material Simulation, Fraunhofer ITWM*

*Eli Leland, PhD, CTO and Co-Founder, Voltaiq, Inc.*

### 16:30 Close of Conference





15-16 MAY 2024 | STRASBOURG, FRANCE

# HYDROGEN & FUEL CELLS

Hydrogen Fueling a Zero-Emissions Future

Co-Located Event

## WEDNESDAY 15 MAY

**12:30 Registration Open**

**12:40 Networking Lunch** (*Sponsorship Opportunity Available*)

**14:00 Dessert Break in the Exhibit Hall with Poster Viewing**  
(*Sponsorship Opportunity Available*)

### Session Header

**14:30 Organiser's Remarks**

**14:35 Chairperson's Remarks**

**14:40 Toyota Hydrogen Overview**

*Tina Singh, Principal Engineer, Sustainability & Regulatory Affairs, Toyota Motor North America*

**15:00 Decarbonizing Heavy Duty Transport – AVLs 40t Fuel Cell Demo Truck**

*Josef Macherhammer, Product Manager Hydrogen and Fuel Cell, AVL List GmbH*  
AVL embarked on the development of a truck demonstrator aimed at showcasing a viable solution for fuel cell-powered trucks that fully addresses the demands of fleet operators. The development was based on a European 4x2 semitrailer tractor with a sleeping cabin and a 3.8-meter wheelbase. This approach presented considerable challenges in terms of accommodating the fuel cell system(s), high-voltage (HV) battery, e-drive, and hydrogen storage systems within the limited space.

**15:20 Sponsored Presentation** (*Opportunity Available*)

**16:00 Refreshment Break in the Exhibit Hall with Poster Viewing**  
(*Sponsorship Opportunity Available*)

**16:30 Hydrogen Trucks**

*Michael Tormoen, Systems Integration Engineer III, Advanced Engineering, Daimler Truck N America*

Hydrogen Fuel Cell Trucks are an important part of Daimler Truck's overall zero-emissions strategy. Daimler Truck has demonstrated the capability of the heavy-duty fuel cell system for long haul with the Mercedes-Benz GenH2 Truck Record Run achieving over 1,000 km of zero emission, loaded operation in real-world conditions on a single fueling. This presentation will highlight the unique challenges and opportunities hydrogen presents for the North American heavy-duty truck market.

**16:50 Numerical Analysis of The Relation Between the Porosity of the Fuel Electrode Support and Functional Layer, and Performance of Solid Oxide Fuel Cells Using Computational Fluid Dynamics**

*Jakub Kupecki, Member of Hydrogen Europe Research, Institute of Power Engineering Research Institute*

**17:10 Catalytic and Electro Catalytic Performance for Applications in Solid Oxide Fuel Cells Supplied with Ethanol Steam Reforming Mixtures**

*Alessandro Donazzi, PhD, Professor, Department of Energy, Politecnico di Milano*

The direct utilisation of alcohols in solid oxide fuel cells for on-board transportation systems can significantly improve the energetic efficiency by using excess heat for internal reforming. Thanks to their resistance to coking, perovskite anodes are promising alternatives to state-of-the-art Ni-based cermets. Novel Sr(Ti<sub>0.3</sub>Fe<sub>0.7</sub>Ru<sub>0.07</sub>)O<sub>3-d</sub> exsolution anodes provide both catalytic reforming activity and electrochemical activity with steam/ethanol mixtures (3:1 m/m) between 700 and 800°C, with 195 mW/cm<sup>2</sup> maximum power density.

**17:50 Networking Reception in the Exhibit Hall with Poster Viewing**  
(*Sponsorship Opportunity Available*)

**19:00 Close of Day**

## THURSDAY 16 MAY

**8:00 Registration and Morning Coffee**

### Session Header

**8:40 Organiser's Remarks**

**8:45 Chairperson's Remarks**

**8:50 Sponsored Presentation** (*Opportunity Available*)

**9:10 Conditions for Hydrogen to be Viable in Road Transport**

*Sigve Aasebo, Senior Advisor, Statens Vegvesen*

Europe lacks electricity and grid. This begs the question of hydrogen for road transport related to energy efficiency and grid efficiency to the forefront. Under which circumstances are hydrogen advisable and when should battery electric vehicles be preferred?

**9:30 Presentation to be Announced**

**9:50 Presentation to be Announced**

**10:30 Coffee Break in the Exhibit Hall with Poster Viewing**  
(*Sponsorship Opportunity Available*)

**11:00 Presentation to be Announced**

**11:20 Presentation to be Announced**

**11:40 Sponsored Presentation** (*Opportunity Available*)

**12:20 Networking Lunch** (*Sponsorship Opportunity Available*)

**13:00 Dessert Break in the Exhibit Hall with Last Chance for Poster Viewing**  
(*Sponsorship Opportunity Available*)

### Session Header

**13:30 Chairperson's Remarks**

**13:35 Presentation to be Announced**

**13:55 Presentation to be Announced**

**14:15 Presentation to be Announced**

**14:55 Session Break**

**15:10 Sponsored Presentation** (*Opportunity Available*)

**15:30 Presentation to be Announced**

**15:50 Exergoeconomic Evaluation of a PEM Fuel Cell**

*Jose R Sodre, PhD, Head, Mechanical Biomedical & Design Engineering, Aston Univ*

This work presents an exergoeconomic evaluation of a 1.2 kW proton exchange membrane (PEM) fuel cell designed for vehicular application. The varied operating parameters were stack temperature, cell voltage and air pressure and air stoichiometry. The results show that air stoichiometry is the most influential parameter on the exergy cost, which is also sensitive to cell voltage and hydrogen price.

**16:30 Close of Conference**



# PRESENT A POSTER AND SAVE €150

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## POSTER INFORMATION

AABC encourages attendees to gain further exposure by presenting their work in the poster sessions. To secure an onsite poster board and/or ensure your poster is included in the conference materials, your full submission must be received, and your registration paid in full by 12 April 2024.

Register and indicate that you would like to present a poster. Once your registration has been fully processed, we will send an email with a unique link and instructions for submitting your materials.

Full time graduate students including Masters, PhD Candidates and post-docs presenting a poster can attend the conference sessions for €399.

### Reasons you should present your R&D findings at this conference:

- Your poster will be seen by this exclusive group of technical and business development executives from major European and international battery companies, automotive technology centers and the global materials and energy industries
- Discuss your research and collaborate with interested attendees and speakers
- Your poster will be published in our conference materials
- Receive a €150 discount off your registration

## FREE Battery Pavilion Space

IN THE EXHIBIT HALL FOR AUTOMOTIVE OEMs

Contact Dave Mello at [dmello@CambridgeEnerTech.com](mailto:dmello@CambridgeEnerTech.com) or visit our website for more information.

### Be a Participant

AABC is now accepting applications from automotive OEMs to showcase their battery technology at the Battery Pavilion at AABC in Strasbourg, France.



[LEARN MORE](#)

### BENEFITS INCLUDE:

- Facilitate detailed communication with the entire automotive battery supply chain
- Receive valuable feedback from colleagues in industry, government, and academia
- Strengthen your brand by showcasing your technology at the preeminent advanced automotive battery event
- Battery Pavilion participants will be featured in an exclusive email to more than 75K energy storage researchers
- Benefit from high-quality exposure on the AABC website, print brochure, and official Program Guide
- Receive the prestige of having your battery and brand on display in the Exhibit Hall
- NO COST for exhibit space or graphics – OEMs only responsible for shipping and material handling

# SPONSORSHIP AND EXHIBIT OPPORTUNITIES

## SIGNATURE SPONSORSHIP

- Networking Dinner Mixer
- Company logo on lanyards
- Four Main Conference Registrations
- Private meeting room for two full days
- Logo on AAB home webpage with a link to your company's homepage
- Full page color advertisement in the Conference Materials

## PLATINUM SPONSORSHIP

- Choice of VIP Dinner (up to 15 guests plus 3 members of your staff) or Session Sponsorship (sponsor will select session)
- Two main conference registrations
- Full page color advertisement in the Conference Materials

## DIAMOND SPONSORSHIP

- Choice of Ride and Drive, or Exclusive Luncheon
- Company logo on lanyards
- Three main conference registrations
- Full page color advertisement in the Conference Materials

## INCLUDED WITH ALL SPONSORSHIP LEVELS

- A 2 x 3 meter exhibit space
- Logo on AAB sponsors webpage with a link to your company's homepage
- Company logo featured on program guide and on conference signage
- Discount for additional delegate conference registrations
- Conference website listing with URL link back to your corporate website
- One-time use of pre and post-conference mailing lists (for a physical mailing) using our 3rd party mail house or your mail house

## KEYSTONE SPONSORSHIP

- Networking Mixer
- Company logo on lanyards
- Three main conference registrations
- Logo on AAB home webpage with a link to your company's homepage
- Full page color advertisement in the Conference Materials

## GOLD SPONSORSHIP

- Choice of 20-Minute Presentation, Exclusive Tote Bag Sponsorship, or 6 – 8 One to One Meetings
- One main conference registration to display literature in the resource centre

## SILVER SPONSORSHIP

- Coffee & Refreshment Break or private meeting room
- One main conference registration
- Opportunity to display literature in the resource centre

## BRONZE SPONSORSHIP

- Choice of Meter Board, or Chair Drop
- Two main conference registrations
- One booth staff pass
- Company listing including contact information and 50- word description (deadlines permitting) included in Conference Materials
- Company name and URL link included in Conference Proceedings package delivered electronically
- Co-operative email campaign inviting your clients and prospects to attend at a discount

For more information regarding sponsorship opportunities, please contact:



Companies A-Q  
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sjohnson@cambridgeenertech.com



Companies R-Z  
**ROD EYMAEL**  
Senior Business Development Manager  
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# SAMPLE LIST OF 2023 DELEGATES

Amazon, Sr Mgr	ExxonMobil Chemical Central Europe GmbH, Global Fluid Technology Advisor, Performance Liquids Technology	Mitsubishi Materials Corp, Sales Rep, MMC RYOTEC Corporation	Phillips 66, Mgr of Special Carbons, Bus Dev
Andreas Stihl AG & Co KG, Purchaser Production Material Battery Cells, Battery Technology	Ferrari SpA, Engineer	Mitsui & Co Ltd, Mgr, Battery Materials & Recycling Business	Porsche AG, Sr Dev Engineer, Dev HV Battery Systems BEV
Audi AG, N EM 552	Fraunhofer Institute for Material & Beam Technology, Process Engineer, Chemical Surface & Battery Technology	NASA Johnson Space Ctr, Asst Dir of Energy Conversion, Power Systems	Saint Gobain, Sr Research Engineer
BMW Grp, Head, Research Battery Technology	General Motors Co, Lead Engineer, Advanced Battery Pack Engineering	Natl Renewable Energy Lab, Chief Energy Storage Engineer, Ctr for Mobility	Samsung SDI, Professional, Next Generation Product Planning
BP, Technologist Expert, Research	Hyundai Mobis Co Ltd, Principal Research Engineer, ePT Core Technology	Natl Taiwan University of Science & Technology, Prof, Advanced Electrochemical Battery & Biosensor Lab	Subaru Corp, Sr Engineer, Electrified Power Unit Design
Castrol Germany GmbH, Sr Technologist PD Driveline & EV Fluids, Driveline Technology Ctr	LG Chem, GM, Battery R&D Center	Nissan Motor Co Ltd, GM, Powertrain & EV Engineering	Toyota Motor Europe, Sr Engineer, Advanced Powertrain
Daimler Truck AG, Mgr, HV Battery Dev	McKinsey & Co Inc, Expert Assoc Partner	Panasonic Industry Europe GmbH, Expert, Battery Cell & Energy Solutions	Volkswagen AG, Developer, CoE Grp of Components & Battery Cathode Materials
Dyson Ltd, Cell Design Mgr, Energy Storage			Volvo Grp, Performance Engineer, Energy Storage Systems
Elkem, Specialist, ESPD Silicon Innovation			Weastbo SE, Lead Engineer Dev, R&D

## 2023 SPONSORS & EXHIBITORS

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CAMX Power	Interco A Metalronics Recycler	PI KEM Ltd	WPX Faserkeramik GmbH
CHASM Advanced Materials	JEOL Germany GmbH	PowerCo SE	
Clarios		Princeton NuEnergy	
Current Chemicals		rhd instruments GmbH & Co KG	
		RISE Research Institutes of	

## HOTEL & TRAVEL INFORMATION

# ➔ Join us in Strasbourg!

### ABOUT THE HOTEL

The AC Hotel and Residence Inn are two brand new hotels in Strasbourg. Some features you will enjoy....

- Location is just a quick 5 min walk from the Convention Centre.
- Both hotels are housed in the same building with a shared roof top terrace.
- Modern spacious rooms for a comfortable stay.
- The hotel restaurant, Archipel, has become one of the premier foodie establishments in Strasbourg with breathtaking views of the city.

For hotel reservations, please go to the Travel page of [AdvancedAutoBat.com/Europe](https://AdvancedAutoBat.com/Europe)

#### CONFERENCE VENUE:

Strasbourg Convention Ctr  
Place de Bordeaux  
67082 Strasbourg cedex, France

#### HOST HOTEL:

AC Hotel & Residence  
Inn Strasbourg  
4 -6 Boulevard de Dresde  
Strasbourg, France, 67000

#### DISCOUNTED ROOM RATE:

€159,00 Single / €179,00 Double \*\*Breakfast Included

DISCOUNTED ROOM RATE CUT-OFF DATE: 4 April 2024



## Can't Join Us In Person?

Connect from anywhere.

Join via our robust virtual platform and access these dynamic features:



INTUITIVE  
INTERFACE



COMPANY  
BRANDING



VIRTUAL  
BOOTH



INTERACTIVE  
DISCUSSIONS



DOWNLOADS



LIVE CHAT



LIVE  
SESSIONS



RECORDED  
SESSIONS



POSTER  
SESSIONS