Online Registration Closes June 16!

- Cover
- Welcome
- Conference-at-a-Glance
- Sponsorship & Exhibitors
- Tutorials
- Agenda
  - R&D Symposia
    - Chemistry
    - Engineering
    - Raw Materials
  - Conference Tracks
    - Plenary Sessions
    - xEV
    - Lead-Based
- Hotel & Travel
- Registration

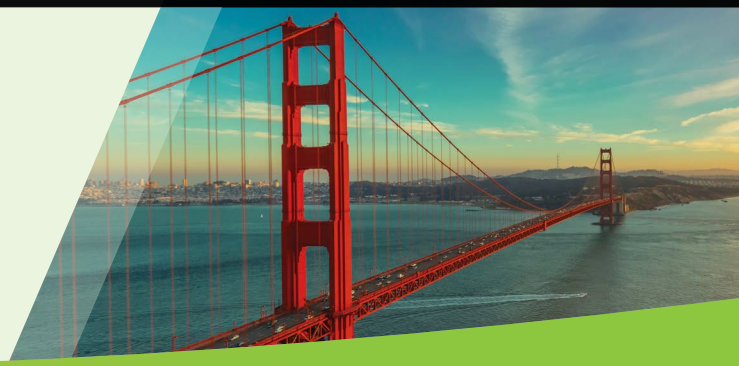
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

17th Annual

advanced automotive battery conference

June 19-22, 2017 • Marriott Marquis, San Francisco, CA



R&D SYMPOSIA
June 19-20

- CHEMISTRY
- ENGINEERING
- RAW MATERIALS

CONFERENCE TRACKS
June 21-22

- xEV
- LEAD-BASED

PROGRAM HIGHLIGHTS

- » Assessment of the Current xEV & xEV-Battery Markets and Future Trends
- » xEV-Battery Technology Updates [Beijing EV, BMW, Fiat Chrysler Automobiles, Ford, GM, Honda, Toyota]
- » Battery Safety Testing: Materials, Cells, Packs, and In-Vehicle
- » Global Automotive Cell Manufacturing Costs & Considerations
- » Beyond Lithium Ion – Solid-State Systems and Li Metal Challenges & Opportunities
- » Lead-Based Battery Technological Advances & New Applications
- » Get Informed of the Challenges and Prospects of Supplying Raw Materials to the Fast-Growing xEV-Battery Industry
- » Network with Battery Technologists from More than a Dozen Top Automotive OEMs

Sponsors

Signature: TOYOTA

Keystone: Johnson Controls

Diamond: USABC — United States Advanced Battery Consortium LLC

Platinum: HONDA — The Power of Dreams

Online Registration Closes June 16!

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

Welcome!

The PEV (Plug-In Electric Vehicle) market took a turn last year when fast expansion in China made it the largest PEV market in the world by far. Europeans are determined to follow suit, with significantly reduced CO_2 emissions for 2021 providing the yardstick; California comes next with the acceleration of the ZEV mandate implementation, while the U.S. federal CAFE standards–under the new republican administration—are currently more of a mystery. The automotive industry is expected to respond to the market and comply with regional regulations. Which xEV powertrains will expand in each of the key international markets is the question of the moment.

Future battery performance, durability, cost, and abuse tolerance are key to achieving cost competitiveness and thus viability for each hybrid/electric vehicle powertrain. This is why AABC was founded, and why the 2017 program features a dedicated session focused on each of these key battery technology attributes. Simply put, the AABC program uncovers the underlying technical and business issues that will impact the pace and path of vehicle electrification worldwide.

While Lead-Acid batteries and supercapacitors are contenders for a low level of hybridization, Lithium-Ion chemistry is the dominant candidate for most applications. Yet, for each of them, some fundamental questions remain:

- What are the specific anode and cathode chemistries?
- Which cell design?
- Which pack design?
- Which suppliers?
- At what cost?
- In what volume for each category?

These questions will be addressed at AABC 2017, where chief battery technologists from major automakers will present their development trends and projected battery needs, and key suppliers will present their latest offerings and roadmaps for the future.

This is a pivotal time for the industry, with production volumes starting to ramp up, the battery designs of new programs being completed and suppliers selected, and next-generation concepts explored. Join us and our new partners from Cambridge EnerTech in San Francisco in June and stay informed on the latest technological advances and trends in a battery market that has never grown so fast!

Sincerely,

Menahem Anderman
Conference Chairman

Top Reasons to Attend

» Learn first-hand about the technical and business directions of international automakers from seven of the major automakers currently active in the market

» Learn about the newest advances in next-generation materials and cell technologies from some of the world's top battery materials experts

» Learn about recent automotive advancements in safety, pack, and cell engineering

» Participate in frank discussions on battery performance, durability, cost, and safety validation

» Learn of the most recent technological advancements that have created smaller, lightweight and long lasting lead-based batteries for critical EV applications

» Cover the global raw materials markets including advances in mining and processing with an emphasis on sourcing and cost control strategies by manufacturers with an international outlook on consumption demands

» Network with the largest 2017 international gathering of automotive energy-storage technology developers and integrators

» Review the challenges and prospects of supplying raw materials to the rapidly growing xEV battery industry

Online Registration
Closes June 16!

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Conference at-a-Glance

	Monday–Tuesday		Wednesday–Thursday
	JUNE 19-20		JUNE 21-22
TUTORIALS	R&D SYMPOSIA		CONFERENCE TRACKS
See page 5	Chemistry		xEV
	Engineering		
	Raw Materials		Lead-Based

Sponsors

Signature

TOYOTA

Keystone

Johnson Controls

Diamond

USABC
UNITED STATES ADVANCED BATTERY CONSORTIUM LLC

Platinum

HONDA
The Power of Dreams

Gold

A123 SYSTEMS
ENEVATE
ERG
Ford
JM Johnson Matthey Inspiring science, enhancing life
MACCOR Battery & Cell Test Equipment Worldwide
PUREgraphite
Pyrotek
SOLVAY asking more from chemistry®

Silver

AV aerovironment
Power Cycling & Test Systems The Standard for Advanced Energy Testing
CORE MOLDING TECHNOLOGIES
TOYO SYSTEM USA, Inc. Serving the World Through Expertise in Energy

Bronze

BLOOMY
IK INABATA
Morgan Advanced Materials
Nikon
SEMCORP POWER YOUR FUTURE
STARLINE

Online Registration
Closes June 16!

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda

R&D Symposia
Chemistry
Engineering
Raw Materials

Conference Tracks
Plenary Sessions
xEV
Lead-Based

Hotel & Travel
Registration

Click Here to Register Online!
AdvancedAutoBat.com/us

Sponsorship & Exhibit Information

Cambridge EnerTech offers diverse sponsorship packages that provide your company the opportunity to showcase your products, services, and solutions to an elite group of delegates. All sponsorship packages are customizable to your company's specific marketing needs and budget. Sponsorship Options Include:

PODIUM PRESENTATIONS WITHIN THE MAIN AGENDA

Showcase your solutions to a guaranteed, targeted audience through a 15- or 30-minute presentation during a specific conference program, breakfast, lunch, or separate from the main agenda within a pre-conference workshop. For the luncheon option, lunches are delivered to attendees who are already seated in the main session room.

EXHIBIT

Exhibitors will enjoy facilitated networking opportunities with qualified delegates. Speak face-to-face with prospective clients and showcase your latest product, service, or solution.

INVITATION-ONLY VIP DINNER/ HOSPITALITY SUITE

Select specific delegates from the pre-registration list to attend a private function at an upscale restaurant or a reception at the hotel. From extending the invitations, to venue suggestions, Cambridge EnerTech will deliver your prospects and help you make the most of this invaluable opportunity.

For additional information regarding sponsorship or exhibits, please contact:

Sherry Johnson
Manager, Business Development

781.972.1359
sjohnson@cambridgeenertech.com

ONE-ON-ONE MEETINGS

Select your top prospects from the pre-conference registration list. Cambridge EnerTech will reach out to your prospects and arrange the meeting for you. A minimum number of meetings will be guaranteed, depending on your marketing objectives and needs. A very limited number of these packages will be sold.

SPONSORSHIP PACKAGES INCLUDE:

Signature Sponsorship
- Networking Dinner Mixer
- Company logo on lanyards
- Three Main Conference Registrations
- Company video will be displayed on large screen monitor
- Private meeting room for two days

Keystone Sponsorship
- Networking Mixer
- Company logo on lanyards
- Three main conference registrations
- Company Video will be displayed on large screen monitor
- Private meeting room for one day

Diamond Sponsorship
- Choice of Monday Welcome Reception, Ride and Drive, or Battery Pavilion
- Three main conference registrations
- Company Video will be displayed on large screen monitor
- Private meeting room for one day

Platinum Sponsorship
- Choice of Monday Welcome Reception, Luncheon or VIP Dinner (up to 15 guests)
- Two main conference registrations
- Company Video will be displayed on large screen monitor

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

MONDAY, JUNE 19, 2017

8:00 - 10:00 AM

TUT1: The Rechargeable Battery Market: Value Chain and Main Trends 2017 - 2027
This tutorial will present 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 & pack cost structure 2017-2027 will be discussed.
Christophe Pillot, Ph.D., Battery Survey Manager, Avicenne Energy, France
Christophe has built up considerable expertise in the area of battery market. He joined AVICENNE 22 years ago and spent 3 years in Japan making analysis on the electronic, mobile & Japanese battery market. Christophe gained large experience in marketing, strategy analysis, technology and financial studies for the battery and power management fields. He developed the battery market analysis for AVICENNE which counts more than 200 customers worldwide. Christophe published several annual surveys like "The Rechargeable Battery Market 2016-2025". He is also the founder & chairman of Batteries Congress in France since 1999. He is now Director of AVICENNE ENERGY.

TUT2: Recent Advances in Solid State Electrolytes for Energy Storage
Dangerous liquid electrolytes are employed over solid electrolytes due to their high conductivities and excellent interfacial behavior. However, current research is narrowing the gap between liquid and solid electrolytes. Solid-state batteries are leading candidates in the pursuit of both higher energy density and improved safety. This course will provide a review of advances in solid electrolytes, from material synthesis, to interfacial stability, to practical device applications. We will also discuss the remaining challenges facing solid state technology, with particular emphasis on electrolytes and prototype cells that show promise for replacing conventional lithium-ion for several applications.
Josh Buettner-Garrett, CTO, SolidPower
Josh Buettner-Garrett specializes in transitioning energy storage technologies out of the laboratory and into products. As Solid Power's CTO, he is responsible for leading the development of high energy batteries based on the company's solid-state technology platform. Prior to his role at Solid Power, Josh led the Energy Storage team at ADA Technologies where he oversaw the development of advanced batteries and ultra-capacitors for a variety of applications. Josh did his graduate studies at Colorado State University where he developed high capacity cathodes with improved cycle life, cost, and safety.

TUT3: Intelligent Transportation: Advances in Autonomous Transportation and Overcoming the Barriers to Consumer Acceptance – Part 1 of 2
The implementation of autonomous technology is at the forefront of OEM vehicle development within applications such as passenger cars, public transportation and commercial vehicles. Making the vision of autonomous driving a reality will require overcoming some significant technological, safety and regulatory barriers. This tutorial will address the latest technological advancements in intelligent transportation and explore how developers will overcome the various safety and regulatory hurdles on the path to implementation. A panel discussion to discuss major market drivers and technological opportunities in autonomous vehicle technology over the next 10 years will be held. Don't miss this opportunity to hear the latest on how autonomous driving is positioned to significantly change the landscape of transportation as we know it today.
Timothy Harris, Co-Founder and CEO, Swift Navigation
Timothy Harris, Co-Founder and CEO of Swift Navigation, is focused on building a world-class organization that will power the next generation of GPS-enabled robots and autonomous vehicles. A proven leader in the high-accuracy GPS industry, Tim leads teams that are excited to drive innovation and challenge each other to achieve visionary change. Prior to Swift, he worked in supply chain consulting for OR Soft Jaenicke GmbH in Halle, Germany, and in corporate finance for Emerge Digital Group, where he oversaw M&A and strategic partnerships for a digital media holding company. Tim holds a JD degree from Boston University and a BA degree from the University of California, Berkeley.
Kyle Landry, Research Associate, Lux Research
Kyle Landry is a Research Associate at Lux Research and is based in Boston. As a member of the Autonomous Systems 2.0 service, he conducts research and market analysis for clients interested in autonomous systems, with representative topics including autonomous vehicles, robotics, unmanned aerial vehicles, and artificial intelligence. Kyle received a dual BS/MS in Mechanical Engineering with a focus in Mechanics from Northeastern University.

10:30 AM – 12:30 PM

TUT4: Intelligent Transportation: Advances in Autonomous Transportation and Overcoming the Barriers to Consumer Acceptance – Part 2 of 2
The implementation of autonomous technology is at the forefront of OEM vehicle development within applications such as passenger cars, public transportation and commercial vehicles. Making the vision of autonomous driving a reality will require overcoming some significant technological, safety and regulatory barriers. This tutorial will address the latest technological advancements in intelligent transportation and explore how developers will overcome the various safety and regulatory hurdles on the path to implementation. A panel discussion to discuss major market drivers and technological opportunities in autonomous vehicle technology over the next 10 years will be held. Don't miss this opportunity to hear the latest on how autonomous driving is positioned to significantly change the landscape of transportation as we know it today.
Instructors: see TUT3

TUT5: Battery Safety and Abuse Tolerance Validation
Batteries have become daily use components for many applications. New growing segments like EV and grid storage batteries extend the traditional ordinary battery applications. In the race for energy density, we should not forget the safety (e.g., the Samsung Galaxy Note 7 battery safety case). Unfortunately, we face daily safety events with injuries and severe damage. This tutorial focuses on portable, stationary and automotive battery safety along the battery cycle life (acceptance, testing, assembly, use, transportation and disposal). The training incorporates Shmuel

*Separate registration required.

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

De-Leon's and other experiences on battery safety representing over 26 years of work in the field. The motivation behind the training is to provide attendees with the knowledge needed to safely handle the batteries in their organization and to support reduction in safety events.
Shmuel De-Leon, CEO, Shmuel De-Leon Energy, Ltd. Shmuel is a leading international expert in the business of energy storage. Prior to founding the company, Shmuel held for over 21 years various positions as an energy storage, electronic engineering and quality control team manager. Shmuel holds a BSc in mechanical engineering from Tel-Aviv University, an MBA in quality control and reliability engineering from the Technion Institute in Haifa, as well as an Electronic Technician's diploma.

TUT6: Materials for Next-Generation Batteries
This tutorial will cover the materials and performance challenges for next-generation batteries for electric vehicles and the electricity grid. The needs and use cases for storage in these two applications will be analyzed, and the possibilities of advanced lithium-ion, lithium-sulfur and multivalent batteries for vehicles will be presented. Lithium and magnesium anodes, wide electrochemical window electrolytes and high voltage cathodes will receive special attention. New discovery approaches based on materials simulation and statistical learning will be discussed.
George Crabtree, Ph.D., Director, Joint Center for Energy Storage Research (JCESR), Argonne National Laboratory & Distinguished Professor of Physics, Electrical and Mechanical Engineering, University of Illinois, Chicago
George Crabtree is Director of the Joint Center for Energy Storage Research (JCESR) at Argonne National Laboratory and Professor of Physics, Electrical, and Mechanical Engineering at University of Illinois, Chicago (UIC). His research interests include next-generation battery technology and integrating energy science, technology, policy and societal decision-making. He has led several workshops for the Department of Energy on energy science and technology, is a member of the National Academy of Sciences and has testified before the U.S. Congress on the hydrogen economy, on meeting sustainable energy challenges, and on the prospects for next-generation electrical energy storage.

Media Partners

Official Media Partner

ESP Energy Storage Publishing

Media Partners

ABT Advanced Battery Technology
altenergymag.com
AutoHarvest.org Collaborate, Innovate and Win
Automotive Engineering
avicenne Energy
batteries an open access journal by MDPI
Bloomberg New Energy Finance
Charged Electric Vehicles Magazine
DoD Power & Energy
ees International The Electrical Energy Storage Magazine
Industrial Minerals
e-mobility insight
Mercom Capital Group
Navigant Research
Shmuel De-Leon Energy Ltd

*Separate registration required.

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

R&D SYMPOSIUM 1

Battery Chemistries for Automotive Applications

June 19-20, 2017 | Marriott Marquis Hotel | San Francisco, CA

MONDAY, JUNE 19

12:30 pm Symposium Registration Open

RECENT ADVANCES IN LITHIUM-ION BATTERY MATERIALS

1:30 Chairperson's Opening Remarks
Martin Winter, Ph.D., Chair, Applied Material Science for Energy Conversion and Storage, MEET Battery, Research Center, Institute of Physical Chemistry, University of Muenster

1:35 FEATURED PRESENTATION: Lithium-Ion Batteries for the 300 Mile EV and More
K.M. Abraham, Ph.D., CTO, E-KEM Sciences
The ability to drive a Li-ion battery powered family car for 300 miles or longer on a single charge is widely recognized as a major milestone for the widespread consumer acceptance of all-electric vehicles. A brief overview of the state-of-the-art of Li-ion battery technology will be presented with an examination of the driving range of electric vehicles using various Li-ion batteries, distinguished by their cathode materials. Future prospects of the energy storage capabilities of Li-ion batteries will be discussed along with an assessment of the potential of advanced rechargeable lithium battery chemistries to fulfill the ambitious goals of electric vehicle propulsion as well as various other portable and stationary energy storage applications.

2:15 Materials for Current and Future Lithium Battery Technologies
Pascal Hartmann, Ph.D., Laboratory Manager, Battery Materials Research, BASF SE
In the near future, only NCM (LiNi1-x-yCoxMnyO2) materials with high nickel content will meet both the energy density and cost targets for EV application. In this talk, both the scientific challenges of high Ni materials will be presented as well as chemical ways to mitigate those. Further, we will give an overview on next generation materials and technologies (e.g. solid-state batteries).

2:35 Advanced High Energy Next-Generation Lithium-Ion Battery for Automotive Applications
Khalil Amine, Ph.D., Distinguished Fellow & Manager, Advanced Battery Technology, Argonne National Lab
In this talk, we will disclose several strategies to increase significantly the energy density of the lithium battery through the development of high energy cathode material coupled with a high voltage electrolyte. We also describe some new approaches of improving the cycle life of Si/carbon composite anodes by impregnating nano-silicon particles within graphene. In addition, we will disclose new pre-lithiation to resolve the issue of large irreversible loss at the Si anode during the initial cycling.

2:55 Refreshment Break

3:15 Approaches to Evaluating Battery Cell Components for Automotive Applications
Zoe Zhou, Ph.D., Research Engineer, Ford Motor Company
Battery cell internal components and materials can impact a variety of performance and durability characteristics of individual cells and associated battery pack systems. This study investigates some of these impacts on the response behavior of cells in exposure to varied abuse conditions. Related trends will be illustrated and unique diagnostic approaches to evaluate component changes will be highlighted.

3:35 Next Generation Automotive Batteries - Challenges in Research and Application
Peter Lamp, Ph.D., Director, Research Battery Technology, BMW Group
This presentation will outline the potential and limits of present material concepts from a car manufacturer point of view. In particular it will address open issues to be solved in the future development of electric energy storage technologies for automotive applications.

3:55 Silicon Anodes: Where to Next?
Anthony Burrell, Chief Technologist, Energy Storage, National Renewable Laboratory
Silicon has received significant attention as a viable alternative to graphitic carbon as the negative electrode in lithium-ion batteries due to its high capacity and availability. More recently it has become apparent that substantial lifetime issues exist in cells with silicon anodes even when not cyclizing. This raises major questions as to the parasitic reactions that occur at the silicon anode. This talk will focus on the challenges that are faced in the development of silicon anodes for lithium ion batteries.

4:15 Silicon-Dominant Anode and Li-Ion Cell Technology Advantages for Vehicle Electrification Applications
Sponsored by ENEVATE
Benjamin Park, Ph.D., Founder & CTO, Enevate Corporation
Unlike conventional silicon technologies which typically involve adding silicon-containing additives to graphite, silicon-dominant technologies in Li-ion batteries offer many benefits for electrical vehicles including high energy density, ultrafast charging, wide temperature operation, and safety. Enevate's low temperature performance and 4C charging will be compared to graphite alternatives

4:35 Q&A

5:00 Close of Day

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

TUESDAY, JUNE 20

8:30 am Symposium Registration Open and Morning Coffee

RECENT ADVANCES IN LITHIUM-ION BATTERY MATERIALS

9:00 Chairperson's Remarks
Martin Winter, Ph.D., Chair, Applied Material Science for Energy Conversion and Storage, MEET Battery, Research Center, Institute of Physical Chemistry, University of Muenster

9:05 Flammable, Toxic and Not Performant Enough: Is There a Chance to Get Rid of Liquid Organic Electrolytes
Martin Winter, Ph.D., Chair, Applied Material Science for Energy Conversion and Storage, MEET Battery, Research Center, Institute of Physical Chemistry, University of Muenster
It is common wisdom, that materials science in the field of electrochemical storage has to follow a system approach as the interactions between active materials, the electrolyte, the separator and various inactive materials (binder, current collector, conductive fillers, cell housing, etc.), are of similar or even higher importance as the properties and performance parameters of the individual materials only. For lithium metal and lithium ion batteries (LIBs), it is widely accepted, that the electrolyte interacts and reacts with the electrodes, influencing not only power density and life, but also safety. Here we reflect the present situation with organic LIB electrolytes with particular emphasis on safety and toxicity and will address the potential of future non-liquid (i.e., gel, hybrid and solid) electrolytes in view of realization novel cell chemistries, particularly lithium metal anode chemistries.

9:25 Electrolyte with Improved Performance at Both Low and High Temperatures
Dee Strand, Ph.D., CSO, Wildcat Discovery Technologies
Automotive applications require batteries with adequate power down to -30°C to start the vehicle. In general, the power capability of the batteries suffers at low temperature due to increases in electrolyte viscosity, as well as poor ionic conductivity in the electrolyte and anode SEI layer. This presentation highlights development of electrolyte formulations with wide operating ranges on both graphite and lithium titanate anodes.

9:45 Stabilizing Water in Batteries
Kang Xu, Ph.D., Senior Research Chemist & Project Lead, US Army Research Lab
Water is the universal solvent in the universe, whose highly polar nature, unique structure and networking properties render its strong solvation power toward almost any inorganic salts. However, its narrow electrochemical stability window (1.23V) restricts its application in electrochemical devices whose electrodes operate at extreme potentials. In this talk, different approaches of stabilizing water electrochemically will be explored.

10:05 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing

Sponsored by TOYO SYSTEM USA, Inc.

11:00 Solvay's Extended Offer for High Voltage Li-Ion Batteries
Thomas Mathivet, Business Development Manager, SOLVAY
A leading target of the Li-Ion battery industry roadmap is to achieve high energy at affordable cost without compromising on safety. Solvay has increased its efforts to propose innovative electrolyte ingredients to battery makers, enabling high voltage solutions, binders for electrodes and separator formulation to increase capacity, cyclability and safety.

Sponsored by SOLVAY

11:20 Active Materials and Additives for Next Generation Lithium Ion Batteries
Michael Kruft, Ph.D., President, Toda Kogyo Europe GmbH
High Nickel cathode materials and Silicon based anode compositions will be the materials of choice for the next generation of Lithium Ion Batteries that shall have higher energy density at lower cost. Toda Kogyo has developed and commercialized a broad range of cathode chemistries that address the specific needs of the LIB market. Recently, high performance Silicon composite materials and conductive additives were added to the portfolio. The presentation will provide an insight into key advantages and challenges of those materials.

11:40 Towards High Cycle Efficiency of High Energy Density Lithium Ion Batteries
Xingcheng Xiao, Staff Researcher, General Motors Research and Development Center
Understanding the relationships between structure and properties of Solid Electrolyte Interphase (SEI) is key to pinpointing the capacity fading mechanisms, and designing high performance/durable electrode coatings, particularly for high capacity electrode materials. In this presentation, we will discuss our approach to elucidate the SEI failure mechanism, and how we developed new surface coatings as artificial SEI layers to achieve high cycle efficiency of high energy LIBs.

12:00 Accurate Determination of Coulombic Efficiency for Lithium Metal Anodes
Ji-Guang (Jason) Zhang, Laboratory Fellow, Energy Processes & Materials Division, Pacific Northwest National Laboratory
In this presentation, we will discuss various factors affecting accurate determination of Coulombic efficiency, which is critical for application of Lithium (Li) metal batteries. These factors include Li deposition/stripping rate and capacity, substrate selection and treatment procedure, need for the conditioning cycle etc.

12:20 Q&A

Sponsored by USABC

12:40 Networking Lunch

1:35 Dessert Break in the Exhibit Hall with Poster Viewing

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

BEYOND AND ASIDE LITHIUM-ION BATTERIES

2:35 Chairperson's Remarks
Martin Winter, Ph.D., Chair, Applied Material Science for Energy Conversion and Storage, MEET Battery, Research Center, Institute of Physical Chemistry, University of Muenster

2:40 Towards All-Solid-State Batteries: A Delicate Balance between Materials and Processing
Olivier Guillon, Ph.D., Professor, Institut für Energie und Klimaforschung
All-solid-state Li- and Na-ion batteries promise to alleviate many issues related to the use of organic liquid electrolytes in conventional batteries and have the potential for improved safety and large increase in energy/power density. To achieve the latter, the combination of ceramic ion conductors with metal on the anode side and mixed cathodes, preferably with high voltage active materials, is necessary.

3:00 The Renaissance of Lithium Metal: SolidEnergy's Role in the Future of Lithium Batteries
Qichado Hu, Ph.D., Founder & CEO, SoildEnergy Systems Corp.
The pursuit of high energy density is at the heart of smartphones, wearable gadgets, wi-fi communication and electric vehicles. Lithium, which is the lightest and most electronegative metal in the periodic table, is a natural choice as anode. SolidEnergy's mission is to power people's lives, whether they are communicating with loved ones on a phone, driving with family in an electric car, or accessing the internet for the first time in a remote village in Africa.

3:40 Q&A

4:00 Networking Reception in the Exhibit Hall with Poster Viewing

Sponsored by Johnson Controls

5:05 Close of Symposium

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

R&D SYMPOSIUM 2

Battery Engineering for Automotive Applications

June 19-20, 2017 | Marriott Marquis Hotel | San Francisco, CA

MONDAY, JUNE 19

12:30 pm Symposium Registration Open

BATTERY SAFETY

1:30 Chairperson's Opening Remarks
Ted Miller, Senior Manager of Energy Storage Strategy and Research, Ford Motor Company

1:35 International Transport Agencies Preparing to Raise the Bar on Lithium Battery Safety
George Kerchner, Executive Director, PRBA - The Rechargeable Battery Association
The United Nations Transport Committee on Dangerous Goods and the International Civil Aviation Organization have begun exploring a new regulatory structure for classifying and shipping lithium batteries. A complete restructuring of the current regulatory requirements can be expected, which will have immediate and long-term implications for any company that plans to ship lithium batteries. An overview will be presented on the current regulatory requirements for shipping lithium batteries, what is currently being developed and considered at the international level, and what are the implications of the UN's and ICAO's activities for the industry.

1:55 A Method of Evaluating Battery Test Lab Safety
Jason Tam, Account Executive, TÜV SÜD America
TUV SUD has developed a measurement system that can determine an overall safety readiness score for a battery test lab that performs life and performance testing. This method captures all of the known hazards that may be encountered, during all of the phases of life and performance testing, including handling, transport and storage of samples, test preparation, battery disassembly and post-mortem analyses. Each hazard is then addressed by a risk containment measure that will deal with that hazard in a predetermined way. The method is flexible enough to add or remove additional risks, for any particular operation.

2:15 Towards Understanding Mechanical Abuse and Failure of Batteries
Sergiy Kalnaus, Ph.D., Research Scientist, Oak Ridge National Laboratory

2:35 Power Electronics-Based Battery Energy Management Systems for Electric Transportation
Sheldon Williamson, Ph.D., Associate Professor, University of Ontario
This talk will illustrate how to enable aggressive usage while maintaining safety through the use of a power electronics-based battery energy management system.

2:55 Refreshment Break

3:15 Single Cell Thermal Runaway Calorimetry
Eric Darcy, Ph.D., Battery Technical Discipline Lead, Propulsion and Power Division, NASA-JSC/EP5
Previous attempts to obtain the total heat output response during thermal runaway (TR) by accelerated rate calorimetry have left us wondering if the results were relevant to field incidents. There's a suspicion that the total heat output is less than if thermal runaway had been induced quickly. We at JSC have designed a single 18650 TR calorimeter that provides total heat output and discerns those heat fractions. Various cell designs with and without bottom vents are compared.

3:35 Experiences and Evaluations of Thermal Propagation Testing
Scott Lananna, Technical Specialist, High Voltage Battery Safety, General Motors Company
A robust understanding of the impacts and interactions of test and battery design variables is critical for industry to converge on effective methods to evaluate the risks of thermal runaway propagation. With an emphasis on battery level outcome, this presentation will review test results characterizing some of these impacts and interactions. The implications of these results on test methods appropriate for engineering standards and regulations will be discussed.

3:55 Safe Core Technology
Speaker to be Announced, Aminox Inc.

4:15 Automotive Lithium-ion Battery (LIB) Supply Chain and U.S. Competitiveness Considerations
Shriram Santhanagopalan, Ph.D., Engineer, Transportation and Hydrogen Systems Center, National Renewable Energy Laboratory
We provide an objective analysis regarding the regional competitiveness contexts of manufacturing lithium-ion batteries (LIB) for the automotive industry by identifying key trends, cost considerations, and other market and policy developments that inform current competitiveness considerations for LIB production. We present findings from a detailed bottom-up cost modeling of regional production scenarios and an overview of qualitative factors that can influence factory location decisions. The NREL cost model includes a detailed, bottom-up accounting of the total costs that a manufacturer incurs in the high-volume production of LIB cells. Preliminary results indicate that Competitive locations and opportunities for automotive lithium-ion battery (LIB) manufacturing are mostly created, as opposed to being tied to factors that are inherent to specific regions. LIB pack production may remain proximal to original equipment manufacturer (OEM) end-product manufacturing, but materials and cell production could locate globally, in areas where competitive opportunities are strong.

4:35 Q&A

5:00 Close of Day

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

TUESDAY, JUNE 20

8:30 am Symposium Registration Open and Morning Coffee

PACK ENGINEERING

9:00 Chairperson's Remarks
Oliver Gross, Technical Fellow, Energy Storage System, FCA US LLC

9:05 Field Study Results from 500e (Life Validation Testing and Real-World Correlation, for EV Batteries)
Oliver Gross, Technical Fellow, Energy Storage System, FCA US LLC
While battery modeling and simulation have both progressed considerably in recent years, verification of life model predictability remains an area which is viewed with lower confidence, given the maturity of actual vehicle field data. The Fiat 500e field data will be presented, against the original life model predictions for the battery. Data analysis, performed jointly with Bosch Battery Systems, will be compared with component tests, and predictive models, in order to identify the most relevant environmental and operations stress factors for the battery.

9:25 Glimpses into xEV Batteries on the Market – AVL Series Battery Benchmarking
Wenzel Prochazka, Ph.D., Product Manager, Global Battery Management Team, AVL List GmbH
The AVL battery benchmarking activity provides a database for objective comparison in technical attributes as well as in engineering methodology with market competitors for clear system target definition of high performing, reliable, and safe batteries. More than 240 different criteria are evaluated through AVL benchmarking metrics displayed in 8 high-level attributes. In this presentation some of the battery system performance criteria are compared using different vehicles as examples, such as the Mitsubishi Outlander, Tesla Model S, Renault Zoe and Chevrolet Bolt.

9:45 Computational Design of Batteries from Materials to Systems
Kandler Smith, Senior Engineer, Transportation and Hydrogen Systems Center, NREL
Computer models are helping to accelerate the design and validation of next generation batteries and provide valuable insights not possible through experimental testing alone. Validated 3-D physics based models exist for predicting electrochemical performance, thermal and mechanical response of cells and packs under normal and abuse scenarios. The talk describes present efforts to make the models better suited for engineering design, including improving their computation speed, developing faster processes for model parameter identification including under aging, and predicting the performance of a proposed electrode material recipe a priori using microstructure models.

10:05 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing

Sponsored by TOYO SYSTEM USA, Inc.

11:00 Sponsored Presentation *(Opportunity Available)*

11:20 Strain-Enabled Multi-Physical Models of Li-Ion Battery Cells for Control and State Estimation
Bogdan Epureanu, Ph.D., Professor, Mechanical Engineering, University of Michigan
This presentation focuses on recent results of creating multiphysical models that enable the use of strain to enhance control and state estimation of battery cells. This model can capture electrical, thermal, and mechanical behaviors of battery cells.

11:40 Life Balancing - A Better Way of Battery Management for Large Battery Packs
Scott Trimboli, Ph.D., Assistant Professor, College of Engineering & Applied Sciences, University of Colorado, Colorado Springs
A novel method of battery management was developed for large battery packs such as those used in Plug In Hybrid and Battery Electric Vehicles where the existing battery management system and DC/DC converter are replaced by an integrated, modular battery management-DC/DC converter system. The system contains of a number of small DC-DC converters in parallel with one or more cells. Differing loads through the DC-DC converters are used to differentially balance the various cells. This method has increased battery life by reducing stress on the weaker cells in the battery.

12:00 pm Materials Processing and Stability Challenges of Anodes and Cathodes for High-Energy-Density Lithium-Ion Batteries
David Wood, III, Ph.D., Team Lead, Roll-to-Roll Manufacturing Manager, Fuel Cell Technologies Program, Joint Faculty Associate Professor, University of Tennessee
Lithium-ion battery pack costs have dropped significantly over the past several years from about $500-600/kWh down to $275-325/kWh due to economies of scale, improvements in electrode and cell quality control, and more efficient production methods. However, much more development on electrode processing cost reduction, coating deposition quality control, and cell assembly methods needs to occur in order to meet the DOE ultimate pack cost of $125/kWh for battery electric vehicles (BEVs).

12:20 Q&A

Sponsored by USABC

12:40 Networking Lunch

1:35 Dessert Break in the Exhibit Hall with Poster Viewing

CELL ENGINEERING

2:35 Chairperson's Remarks
Robert Spotniz, President, Battery Design LLC

2:40 New and Pragmatic Methods to Model the Thermodynamics of Lithium Ion Battery Electrodes
Mark Verbrugge, Ph.D., Director, Chemical and Materials Systems Laboratory, General Motors
We derive and implement a method to describe the thermodynamics of electrode materials based on a substitutional lattice model. To assess the utility and generality of the method, we compare model results with experimental data for a variety of electrode materials: lithiated graphite, silicon, NMC (nickel manganese cobalt oxide), manganese oxide, and iron phosphate. The model enables one to quantitatively represent experimental data from these different electrode materials with a small number of parameters, and, in this sense, the approach is both general and efficient. An open question is the utility of controlled-potential vs. controlled-current experiments for the elucidation of the system thermodynamics.

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

3:00 High Throughput Atomic Layer Deposition: Interfacial Engineering at Scale
James Trevey, Ph.D., Vice President, ForgeNano
The bulk materials designed for today's leading batteries suffer from degradation that results in poor performance and short lifetime. By applying Forge Nano's patented high-throughput atomic layer deposition process, current bulk materials can be upgraded to perform beyond industry established performance metrics. The benefits of ALD have been widely demonstrated over the past few decades; however, the technology has been considered dead among the industry due to its lack of scale and prohibitive costs.

3:20 Virtual Electrode Engineering: From Mesoscale Underpinnings to System Characteristics
Partha P. Mukherjee, Ph.D., Assistant Professor, Mechanical Engineering, Morris E. Foster Faculty Fellow II, Texas A&M University
In recent years, lithium-ion batteries (LIB) have emerged as a leading candidate for vehicle electrification. Porous electrodes, with underlying coupled physicochemical processes, play a critical role in the performance, life, and safety of LIBs. This talk will seek to demonstrate the role of virtual electrode engineering, relying on mesoscale physics-based modeling and analysis, in discerning the lithium-ion battery system characteristics.

3:40 Q&A

4:00 Networking Reception in the Exhibit Hall with Poster Viewing

Sponsored by Johnson Controls

5:05 Close of Symposium

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

R&D SYMPOSIUM 3

Global Battery Raw Materials

June 19-20, 2017 | Marriott Marquis Hotel | San Francisco, CA

MONDAY, JUNE 19

12:30 pm Symposium Registration Open

ADVANCED BATTERY MATERIALS

1:30 Chairperson's Opening Remarks
Simon Moores, Managing Director, Benchmark Mineral Intelligence, United Kingdom

1:35 The Supply Chain Heat Map for Key Materials in Li-Ion Batteries
Kurt Vandeputte, Vice President, Rechargeable Battery Materials Business Unit, Umicore
The number and complexity of Li-ion battery applications are still growing significantly and, combined with an acceleration of demand for Li-ion batteries, this has resulted in increasingly complex raw-material supply chains. Insights into the supply-demand balance for a number of key materials used in Li-ion batteries will be presented. A more detailed analysis will be given, using specific examples, resulting in a supply chain heat map for key materials used in Li-ion battery production.

1:55 Advancing Next Generation Lithium Batteries
Marina Yakovleva, Global Commercial Manager for New Product and Technology Development, FMC Corporation
FMC continues its focus on customer applications and emerging technologies through its R&D efforts in developing new products and technologies that can meet the demand for higher energy density systems. The presentation will review FMC's outlook on the rechargeable Li-ion market. The role of Lithium precursors in the development of the advanced cathode materials and FMC's road map for the advancements of the Li-ion and beyond Li-ion systems will also be discussed.

2:15 Genuine Demand, Speculation or Government Policy - What Have Been the Key Drivers in the Fluctuating Price Developments in Battery Raw Materials
Barbara O'Donovan, Editor, Industrial Minerals
This presentation will review the price trends in lithium, graphite, cobalt and nickel and focus on the key issues which have driven the markets in the last 18 months, particularly the spikes in lithium prices and bull run in cobalt. The focus will be on the battery grade materials for each of these commodities. The challenges facing new suppliers in the market and the ongoing trends in material substitution.

2:35 Production of Lithium Hydroxide at Lower Cost
Jean-François Magnan, Technical Manager, Nemaska Lithium
Nemaska proprietary technology allows to produce Lithium hydroxide directly at a lower cost than most of the actual Lithium carbonate producers. Lithium hydroxide is required for the production of high-grade nickel cathode material having high energy density such as NCA and NMC. Also, depending on the chemistry and the process to synthesize the cathode material, Lithium hydroxide has many technical advantages over Lithium carbonate.

2:55 Refreshment Break

3:15 North American Supply of Premier Graphite Anode Materials
Sponsored by Pyrotek
Jeremy Schrooten, Senior Engineer, Research & Development, Pyrotek
Pyrotek has processed graphite anode materials for lithium-ion batteries since the early 1990s. Our proprietary, low-emission furnace technology utilizes clean, renewable hydroelectric power as a North American source for graphitization and purification of graphite anode materials. This presentation will provide an overview of our technological and environmental advantages that show state-of-the-art performance is attainable at a competitive price point.

3:35 Designing Cells for Cost and Scale by Enabling Diversification in Supply Chain
Rick Chamberlain, CTO, Boston-Power
I will present Boston-Power's plans for scaling Lithium-ion battery production to meet the demands of EVs, with focus on the China market. I will cover aspects of cell design and how they relate to supply chain and influence the ability to scale production volumes and achieve cost targets.

3:55 Accelerate the Launch of New Lithium-Ion Cell Technologies via Rapid Prototyping and Collaborative Partnerships: The View from the Early Stage Material Developer
Nick Gurnon, Scientist, Polaris Battery Labs
There are significant new material inventions in Lithium ion and other advanced battery chemistries in the U.S. that can have a dramatic impact on product performance. Some key questions that will be addressed include 1). Why it's so hard to bring a new battery chemistry to market, 2). The process for launching a new material, electrode or cell into full production, and 3). Manufacturing challenges, make vs. buy, Asia. Our labs accelerate new Lithium-ion battery developments with emphasis on early stage raw material inventions.

4:15 Toward Better Understanding of the Cost Associated with Upstream and Downstream Manufacturing Processes of Lithium-Ion Batteries for Automotive Applications
Ahmad Mayyas, Ph.D., Research Engineer, Strategic Energy Analysis Center, National Renewable Energy Laboratory
This work focuses on cost associated with extraction and purification of raw materials

used in Li-ion batteries such as Co, Ni, Mn and graphite. This work also attempts to expand cost analysis to cover costs associated with cells and modules packaging. Value chain analysis will be used to facilitate understanding of costs in the manufacturing processes of Li-ion batteries.

4:35 Q&A

5:00 Close of Day

TUESDAY, JUNE 20

8:30 am Symposium Registration Open and Morning Coffee

GLOBAL LITHIUM SUPPLY CHAIN – TRENDS & ANALYSIS

9:00 Chairperson's Remarks
Doug Morris, CEO, Polaris Battery Labs, LLC

9:05 Battery Grade Raw Material Supply Evolution: Discussing Price Volatility, Rapid Expansion and Significant Investment Happening to Fuel the Energy Storage Revolution
Simon Moores, Managing Director, Benchmark Mineral Intelligence, United Kingdom
In this presentation, I will discuss the Battery grade raw material supply evolution. Discussing price volatility, rapid expansion and significant investment happening to fuel the energy storage revolution will be presented.

9:25 Lithium-Ion Battery Raw Material Supply and Demand 2016 - 2025
Christophe Pillot, Ph.D., Battery Survey Manager, Avicenne Energy, France
This presentation includes cathode, anode, electrolyte and separator demand. It will examine the major component suppliers and include a discussion on price evolution and major technical trends.

9:45 The Road to $100/KWH
Sam Jaffe, Managing Director, Cairn Energy Research Advisors
This talk will explore the road ahead in materials sourcing and explore how battery companies can further reduce pricing to the point where EVs become a sensible economic decision for consumers. The talk will also include examples of some companies that are already taking the steps necessary to make EVs a sensible decision. Finally, the presentation will conclude with Cairn ERA's pricing forecast for automotive traction Li-ion batteries.

10:05 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing
Sponsored by TOYO SYSTEM USA, Inc.

11:00 ERG's Metalkol RTR Project: Long Term Sourcing of Sustainable and Ethically Mined Cobalt
Sponsored by ERG
Tony Southgate, Head, Strategic Cobalt Marketing, Eurasian Resources Group
The globally expanding battery sector is increasingly focused on securing sustainable and ethically sourced cobalt. This presentation will explore how this goal can be achieved using ERG's Metalkol RTR Project as a case study.

11:20 Leveraging the Lithium-Ion Battery Supply Chain to Position Organizations for Continued Growth and Acceptance of Electric Vehicles
Chris Berry, Founder, House Mountain Partners, LLC
As Lithium-ion battery prices continue to fall by 8% to 14% per year and public policy lines up behind the need to de-carbonize, the implications for this shift across multiple industries, from mining, to battery manufacturer, to OEM, to utility are profound and it appears that nobody is entirely sure what the next five years hold. With interest rates at historic lows around the world and generally sluggish growth accompanying this, companies and investors alike will need to find new markets that offer high growth opportunities to survive and thrive.

11:40 Lithium-Ion Battery: Sustainable Supply Chain to Build a Sustainable Manufacturing
Shailesh Upreti, Ph.D., President, C4v; Center of Excellence, SUNY Binghamton
Recently Lithium-ion battery-based products have been analyzed critically to study their supply chain operations and related manufacturing challenges. There are certain downstream processes as well as chemical that are seriously concerning, however have still been used for many decades in refining raw materials to make them usable for Li-ion battery manufacturing. My talk would highlight some of such issues and discuss a few commercially available solutions and products that could open doors for new technologies at different stages of Li-ion battery value chain.

12:00 pm Battery Growth Opportunities Meeting the Requirements of Growing Markets and Applications
Shmuel De-Leon, Founder and CEO, Shmuel De-Leon Energy, Ltd.
The battery industry faces a new challenge – growing demand for Li-ion cells and batteries that exceeds the current manufacturing capabilities. How will that effect the cells and battery cost? When can we expect to have the breakeven between demand and supply? What are the new Li-ion rechargeable technologies that can provide us the breakthrough we are looking for? What is the timeframe?

12:20 Q&A

12:40 Networking Lunch
Sponsored by USABC

1:35 Dessert Break in the Exhibit Hall with Poster Viewing

TRENDS IN RAW MATERIALS INVESTMENT & MARKET DEMAND

2:35 Chairperson's Remarks
Shmuel De-Leon, Founder and CEO, Shmuel De-Leon Energy, Ltd.

2:40 Mergers and Acquisitions in the Battery and Battery Materials Market
Scott Mulcahy, Managing Director, Investment Banking, XMS Capital
Merger, acquisition and divestiture activity is quite high with record level valuations and the availability of capital. Acquirers in the battery material sector have competition for high quality targets and companies seeking strategic or purely investment capital have multiple alternatives. The battery materials sector is entering a growth phase that we expect to be marked by break-through developments. Assessing the right opportunities in a market that will have winners and losers is critical.

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

3:00 Why Graphite Really Matters

Sponsored by PUREgraphite

Edward Buiel, Ph.D., Managing Director, PUREgraphite

Ed will share some recent research results that highlight the vital role of graphite in determining the battery performance and in building better batteries in the future and provide an overview on the latest PUREgraphite materials available and the results that can be expected.

3:20 PANEL DISCUSSION: Barriers and Opportunities to Meeting Global Market Demand for Advanced Battery Materials

Moderators:
Barbara O'Donovan, Editor, Industrial Minerals
Panelists:
Scott Mulcahy, Managing Director, Investment Banking, XMS Capital
Edward Buiel, Ph.D., Managing Director, PUREgraphite
Shmuel De-Leon, Founder and CEO, Shmuel De-Leon Energy, Ltd.

It is estimated that the global energy storage markets have the potential to reach over $150 billion annually. These markets represent significant opportunities for investment and R&D. This international panel of experts will discuss meeting the challenges of increasing global demand with keeping costs low while continuing to advance technology. The panel will explore which organizations are well positioned to capitalize on the growth and where the key opportunities are for investment.

3:40 Q&A

4:00 Networking Reception in the Exhibit Hall with Poster Viewing

Sponsored by Johnson Controls

5:05 Close of Symposium

Online Registration Closes June 16!

Cover

Welcome

Conference-at-a-Glance

Sponsorship & Exhibitors

Tutorials

Agenda

R&D Symposia

Chemistry
Engineering
Raw Materials

Conference Tracks

Plenary Sessions
xEV
Lead-Based

Hotel & Travel

Registration

Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

WEDNESDAY, JUNE 21

PLENARY SESSION: xEV AND xEV-BATTERY MARKET

9:00 Chairperson's Opening Remarks
Menahem Anderman, Ph.D., President, Total Battery Consulting, Inc.

9:05 Meeting ZEV and Customer Requirements
Michael Lord, Executive Engineer, Product Regulatory Affairs/ Environmental Regulation, Toyota Motor North America
Government mandates alone cannot assure ZEV goals are met. ZEV must fulfill the basic requirements of the customer in a cost effective manner. Only then will the ZEV market expand beyond the early adopter into the mass market. This presentation will explore what can be done to close the gap between where we are with the current market and where we want to go.

9:25 xEV Technologies to Reach ZEV Targets and Lower Fuel Consumption
Robert Bienenfeld, Assistant Vice President, Environment & Energy Strategy, American Honda Motor Co., Inc.
Mr. Bienenfeld will provide an outlook for achieving 2030 goals. This will include an analysis of xEV pathways, infrastructure requirements, and critical policy support mechanisms to achieve these goals.

9:45 California CO_2 Reduction Targets
Mike McCarthy, CTO, ECARS, California Air Resources Board
ARB's Scoping Plan outlines proposed actions to meet the most aggressive climate target in North America: a 40 percent reduction in greenhouse gases by 2030. ARB has also released a state strategy identifying the need for an additional 80 percent reduction in smog-forming emissions to meet national ambient air quality standards. Critical reductions are needed from mobile sources – cars, trucks, and off-road equipment and the fossil fuels that power them – as they are the largest contributors to the formation of smog and greenhouse gas emissions in California.

10:05 Coffee Break in the Exhibit Hall with Poster Viewing

Sponsored by CORE MOLDING TECHNOLOGIES

11:00 xEV Expansion by World Region
Menahem Anderman, Ph.D., President, Total Battery Consulting, Inc.
In this presentation, electrified-vehicle market expansion and battery technology and market development from micro-hybrids to full EVs will be discussed. Battery performance enhancement, cost reduction, and key producers will be examined vis-à-vis battery durability, reliability, and safety. Market trends in Europe, the U.S., China, and Japan will be reviewed with the pace of market growth depending predominantly on governmental regulations and incentives, and battery pricing.

11:20 The Continuously Evolving Status of the Chinese xEV Market, and a Strategic Analysis of the Top Battery Companies
Mark Lu, Certified Senior Industrial Analyst, Industrial Economics & Knowledge Center (IEK), Industrial Technology Research Institute (ITRI)
Chinese xEV sales continue to grow rapidly. This growth in demand has constituted an equivalent growth in the demand for batteries, which has attracted overseas battery manufacturers. Therefore, this presentation will cover both updated market information and battery product comparisons. The market information part will focus on the effect of policies on demand within the Chinese xEV market; the battery product comparison part will look at present battery technical levels and differences in strategy among top battery manufacturers.

11:40 Present Status and Future Trend of LiB Cell and Material Market – How Manufacturers in Each Country/Region Should Do Business
Sachiya Inagaki, General Manager, Industrial Technology Unit, Yano Research Institute, Ltd.
Thanks to the expanding market of xEV, LiB cell and materials markets are also booming. Then, many manufacturers try to expand their production capacity in order to meet the demand from their customers. But do we really need that much? I will analyze and report how we should go through such a tough market situation based on our market research data and result.

12:00 pm Q&A

PRESENT A POSTER!

Share your latest R&D findings with this exclusive group of technical and business development executives from major American and international battery companies, automotive technology centers and the global materials and energy industries. Accepted poster presenters also receive a **$150 discount*** off their registration fee.

The deadline to apply is **May 12, 2017.**

Please visit our website for more information.

Poster abstracts are due by May 12, 2017. Once your registration has been fully processed, we will send an email containing a unique link allowing you to submit your poster abstract. If you do not receive your link within 5 business days, please contact **jring@cambridgeenertech.com.**

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

TRACK 1

xEV Battery Technology, Applications, and Market

June 21-22, 2017 | Marriott Marquis Hotel | San Francisco, CA

WEDNESDAY, JUNE 21

8:00 am Main Conference Registration Open and Morning Coffee

PLENARY SESSION: xEV AND xEV-BATTERY MARKET

9:00 Chairperson's Opening Remarks
Menahem Anderman, Ph.D., President, Total Battery Consulting, Inc.

9:05 Meeting ZEV and Customer Requirements
Michael Lord, Executive Engineer, Product Regulatory Affairs/ Environmental Regulation, Toyota Motor North America
Government mandates alone cannot assure ZEV goals are met. ZEV must fulfill the basic requirements of the customer in a cost effective manner. Only then will the ZEV market expand beyond the early adopter into the mass market. This presentation will explore what can be done to close the gap between where we are with the current market and where we want to go.

9:25 xEV Technologies to Reach ZEV Targets and Lower Fuel Consumption
Robert Bienenfeld, Assistant Vice President, Environment & Energy Strategy, American Honda Motor Co., Inc.
Mr. Bienenfeld will provide an outlook for achieving 2030 goals. This will include an analysis of xEV pathways, infrastructure requirements, and critical policy support mechanisms to achieve these goals.

9:45 California CO_2 Reduction Targets
Mike McCarthy, CTO, ECARS, California Air Resources Board
ARB's Scoping Plan outlines proposed actions to meet the most aggressive climate target in North America: a 40 percent reduction in greenhouse gases by 2030. ARB has also released a state strategy identifying the need for an additional 80 percent reduction in smog-forming emissions to meet national ambient air quality standards. Critical reductions are needed from mobile sources – cars, trucks, and off-road equipment and the fossil fuels that power them – as they are the largest contributors to the formation of smog and greenhouse gas emissions in California.

10:05 Coffee Break in the Exhibit Hall with Poster Viewing *Sponsored by* CORE MOLDING TECHNOLOGIES

11:00 xEV Expansion by World Region
Menahem Anderman, Ph.D., President, Total Battery Consulting, Inc.
In this presentation, electrified-vehicle market expansion and battery technology and market development from micro-hybrids to full EVs will be discussed. Battery performance enhancement, cost reduction, and key producers will be examined vis-à-vis battery durability, reliability, and safety. Market trends in Europe, the U.S., China, and Japan will be reviewed with the pace of market growth depending predominantly on governmental regulations and incentives, and battery pricing.

11:20 The Continuously Evolving Status of the Chinese xEV Market, and a Strategic Analysis of the Top Battery Companies
Mark Lu, Certified Senior Industrial Analyst, Industrial Economics & Knowledge Center (IEK), Industrial Technology Research Institute (ITRI)
Chinese xEV sales continue to grow rapidly. This growth in demand has constituted an equivalent growth in the demand for batteries, which has attracted overseas battery manufacturers. Therefore, this presentation will cover both updated market information and battery product comparisons. The market information part will focus on the effect of policies on demand within the Chinese xEV market; the battery product comparison part will look at present battery technical levels and differences in strategy among top battery manufacturers.

11:40 Present Status and Future Trend of LiB Cell and Material Market – How Manufacturers in Each Country/Region Should Do Business
Sachiya Inagaki, General Manager, Industrial Technology Unit, Yano Research Institute, Ltd.
Thanks to the expanding market of xEV, LiB cell and materials markets are also booming. Then, many manufacturers try to expand their production capacity in order to meet the demand from their customers. But do we really need that much? I will analyze and report how we should go through such a tough market situation based on our market research data and result.

12:00 pm Q&A

12:20 Networking Lunch *Sponsored by* A123 SYSTEMS

1:05 Dessert Break in the Exhibit Hall with Poster Viewing *Sponsored by* Ford

xEV BATTERY TECHNOLOGY

2:00 Chairperson's Opening Remarks
Pablo Valencia, Senior Manager, Global Battery Engineering, General Motors

2:05 Battery Development for Prius Prime
Akira Kiyama, Assistant Manager, Battery Evaluation & Analysis Department, Battery Material Engineering & Research Division, Toyota Motor Corporation
The new Prius Prime, released in 2016, incorporates more lithium ion cells each with higher capacity than those used in the 1st generation Prius Plug-in. The result is a vehicle with longer EV mode range at a higher top

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

speed. This presentation will discuss the development of the battery for the Prius Prime, including results from the safety and reliability evaluations.

2:25 Technology Roadmap of BJEV's Battery System and Ecosystem for Battery Remanufacturing/Recycling
Chengyin Yuan, Ph.D., Vice President, Beijing Electric Vehicle Co., Ltd.
This talk will present the battery system technology roadmap of Beijing Electric Vehicle Co., Ltd. and introduce the ecosystem for Li-ion battery remanufacturing and recycling.

2:45 High Performance xEV ESS Technology Development by Johnson Matthey Battery Systems
Sponsored by Johnson Matthey
Allan Paterson, Ph.D., Chief Electrochemist, Engineering, Johnson Matthey Battery Systems.
Johnson Matthey Battery Systems designs, develops and supplies battery systems for demanding eMobility and Automotive applications, such as performance hybrids, plug-in hybrid electric vehicles and full battery electric vehicles. This talk presents several case studies for high performance battery development from materials and cell selection, optimisation and engineering through to full battery integration. These case studies highlighting JM's technical and electrochemistry capabilities to support customers through to volume manufacture in the above light and heavy duty automotive xEV markets.

3:05 Refreshment Break in the Exhibit Hall with Poster Viewing
Sponsored by AVL Power Cycling & Test Systems

4:00 48V Battery Requirements
Jeff Kessen, Vice President of Corporate Strategy, A123 Systems
While 48V automotive batteries have only recently entered series production, a second generation is already being actively planned. In most initial applications, 48V systems focused on vehicle efficiency improvements necessary to meet regulatory requirements. Looking forward, additional vehicle features are expected to drive considerable increases in required battery capacity and power. This presentation will discuss the evolving vehicle level drivers for 48V systems and the implications for future battery design.

4:20 SK's Battery Life Prediction for EV
Jangweon Rhee, Ph.D., Head of Battery and IE Materials R&D Center, Vice President, SK Innovation
SK innovation has been accumulating battery technologies over 20 years, and expanding xEV market share using its own technology. The xEV market requires over 10 years of field life, and battery suppliers should guarantee this requirement from short lab tests. Thus, it is very important to project battery life accurately. SK demonstrated the reliability of battery life prediction by matching estimated data with actual field data. For accurate life prediction, specific user scenarios should be established.

4:40 Leading Edge Vehicle Electrification
Andrew Oury, New Products Battery Strategy Manager, General Motors
General Motors is building the electric, connected, autonomous and shared transportation solutions of the future. Building off successful launches of a range of electrified vehicles – from the Chevrolet Malibu Hybrid to the Chevrolet Bolt EV – GM is shifting into high gear, as it were, to develop the next generation of xEVs. Mr. Oury will highlight the broad range of customer needs in the future, how those needs impact Lithium-Ion battery pack design and the criticality of meeting aggressive performance and cost targets.

5:00 Q&A

5:20 Networking Reception in the Exhibit Hall with Poster Viewing
Sponsored by TOYOTA

6:30 End of Day

THURSDAY, JUNE 22

8:30 am Registration Open

9:00 Continental Breakfast Roundtable Discussions
Join your colleagues and fellow delegates over breakfast for a focused, informal discussion moderated by a member of our speaking faculty. A small group format allows participants to meet potential collaborators, share examples from their own work and discuss ideas with peers. Visit our website to see the full listing of topics and moderators.

10:00 Coffee Break in the Exhibit Hall with Poster Viewing

VEHICLE REFUELING/CHARGING AND ELECTRIFICATION INFRASTRUCTURE AND LOGISTICS

11:00 Chairperson's Remarks
Michael Lord, Executive Engineer, Product Regulatory Affairs/Environmental Regulation, Toyota Motor North America

11:05 The Full Cycle: EV Battery Production Costs and Forecasts, from Raw Materials to End-of-Life
Logan Goldie-Scot, Manager of the Energy Storage Insight Team, Bloomberg New Energy Finance (BNEF)
There are currently 38 GWh of EV batteries on the road. By 2030, we forecast yearly battery demand to be 713 GWh. At this scale, the entire value chain, from raw materials to recycling and second life providers will see the effects of electrification. BNEF writes extensively on battery markets and technology and can offer a unifying view across both EV and energy storage applications. Through our research, we provide in-depth analysis, drawing on our proprietary datasets and industrial contacts. We have compiled extensive data on both EVs and batteries, and can illustrate the links between these markets and broader clean energy trends globally.

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

11:25 Dynamic Charging System for EV
Takamitsu Tajima, Chief Engineer, Honda R&D Co., Ltd. Automobile R&D Center
Major issues facing EV include range, charging, and vehicle weight. This study developed a high-power dynamic charging system that uses high power to charge a traveling EV, with the goal of realizing an unlimited vehicle range. This enables complete energy charging of a traveling EV in a short time and allows drivers to freely drive over the intended route after charging. This report describes a system, presents the results of running tests, and discusses future prospects.

11:45 xEV Industry Trends of Charging & Battery Systems
Kevin Konecky, Battery Systems Consultant, Total Battery Consulting, Inc.
Lithium-ion battery systems are an enabling technology in the propagation of xEVs with longer range and higher-energy-density batteries. Further enabling public acceptance are convenient and time-effective charging options. This presentation will review a large number of xEVs currently in production and discuss trends and diversity in the subsystem design choices that were implemented in each production system including charge capabilities. Different charging protocols and standards across the globe will be discussed with trends analyzed, as well as improvements to user convenience including faster DC-charging and wireless charging.

12:05 pm Fuel Cell Electric Vehicles: The Other ZEV Option
Bill Elrick, Executive Director, California Fuel Cell Partnership
Multiple fuel cell electric vehicles are now commercially available in California, with more models readying in the wings. The initial refueling network has begun to appear with dozens of retail fast-fill hydrogen stations in major metropolitan regions as well as various connector and destination stations across the state. Learn what makes this zero emission vehicle technology a valuable addition to the market, and what lies ahead for California, the US, and globally.

12:25 Q&A

12:40 Networking Lunch

1:30 Dessert Break in the Exhibit Hall with Poster Viewing

BATTERY LIFE AND RELIABILITY

2:15 Chairperson's Remarks
Bob Taenaka, Technical Leader Advanced Battery Systems, Ford Motor Company

2:20 Ford Battery Life & Reliability
Bob Taenaka, Technical Leader Advanced Battery Systems, Ford Motor Company
Ford Motor Company has launched three generations of production electrified vehicles, starting with the Escape Hybrid in 2004. Traction battery life was the #1 concern by potential xEV customers in 2004, but with lab and field data for its nickel-metal hydride batteries (model years 2004 through 2012) and lithium-ion batteries (model years 2013 to present), Ford has demonstrated a good track record for traction battery service life and reliability.

2:40 Customers' Usage and Durability of Li-Ion Batteries for Honda's Electrically-Propelled Vehicles
Takuya Miyashita, Assistant Chief Engineer, Honda R&D Co., Ltd. Automobile R&D Center
Honda collects, by the means of diagnostic device or telematics system, the usage and status data of the Li-ion batteries of users' electrically propelled vehicles (e.g. EV). The data reveal how the batteries are used by users and degrade in actual use, in comparison to engineers' design assumption. The paper also briefly introduces a few cases, in which the data are analyzed and utilized for better quality control or improvement in designing the next-generation battery.

3:00 Advances in Battery Life Simulation
Gi Heon Kim, Ph.D., Vice President, Samsung SDI
Fully enjoying battery performance for elongated service life is the value EV industry trying hard to deliver their customers. This requires enhancing the awareness of battery evolution along its lifetime. Desires for accurately predicting the changes in battery internal states have promoted development of a fully-adaptive fast-running high-fidelity computational model. This talk will introduce recent advances in battery life modeling at Samsung SDI.

3:20 Refreshment Break

3:40 Modeling of Key Parameters for Cell Life
Yimin Wei, Ph.D., Research Director, Material Analysis Center, Research Institute, Contemporary Amperex Technology Co., Limited (CATL)
In this presentation, I will try to give a whole picture of the general life fading mechanisms for commercial xEV LIBs. The critical fading parameters, main challenges and strategies for cell life modeling will then be discussed, including the swelling, gassing, calendar life & cycle life issues.

4:00 Routes to Understand the Impact of Aggressive Use Conditions on Battery Durability and Reliability
Eric Dufek, Energy Storage Group Lead, Energy Storage & Advanced Vehicles Department, Idaho National Laboratory
Durable and reliable batteries are of the utmost importance for advanced adoption of electric vehicles. As the interest in faster charging increases and as technological advancements are made to improve the energy density of batteries, the need to quantifiably understand how durability and reliability are impacted becomes more important. Routes to monitor impacts of fast charging, vibration and the degradation of advanced materials and electrode designs are currently being developed and implemented at Idaho National Laboratory.

4:20 Q&A

4:40 Closing Remarks

4:50 End of Conference

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

TRACK 2

Chemistry & Materials for Lead-Based Batteries

June 21-22, 2017 | Marriott Marquis Hotel | San Francisco, CA

WEDNESDAY, JUNE 21

8:00 am Main Conference Registration Open and Morning Coffee

PLENARY SESSION: xEV AND xEV-BATTERY MARKET

9:00 Chairperson's Opening Remarks
Menahem Anderman, Ph.D., President, Total Battery Consulting, Inc.

9:05 Meeting ZEV and Customer Requirements
Michael Lord, Executive Engineer, Product Regulatory Affairs/ Environmental Regulation, Toyota Motor North America
Government mandates alone cannot assure ZEV goals are met. ZEV must fulfill the basic requirements of the customer in a cost effective manner. Only then will the ZEV market expand beyond the early adopter into the mass market. This presentation will explore what can be done to close the gap between where we are with the current market and where we want to go.

9:25 xEV Technologies to Reach ZEV Targets and Lower Fuel Consumption
Robert Bienenfeld, Assistant Vice President, Environment & Energy Strategy, American Honda Motor Co., Inc.
Mr. Bienenfeld will provide an outlook for achieving 2030 goals. This will include an analysis of xEV pathways, infrastructure requirements, and critical policy support mechanisms to achieve these goals.

9:45 California CO_2 Reduction Targets
Mike McCarthy, CTO, ECARS, California Air Resources Board
ARB's Scoping Plan outlines proposed actions to meet the most aggressive climate target in North America: a 40 percent reduction in greenhouse gases by 2030. ARB has also released a state strategy identifying the need for an additional 80 percent reduction in smog-forming emissions to meet national ambient air quality standards. Critical reductions are needed from mobile sources – cars, trucks, and off-road equipment and the fossil fuels that power them – as they are the largest contributors to the formation of smog and greenhouse gas emissions in California.

10:05 Coffee Break in the Exhibit Hall with Poster Viewing *Sponsored by* CORE MOLDING TECHNOLOGIES

11:00 xEV Expansion by World Region
Menahem Anderman, Ph.D., President, Total Battery Consulting, Inc.
In this presentation, electrified-vehicle market expansion and battery technology and market development from micro-hybrids to full EVs will be discussed. Battery performance enhancement, cost reduction, and key producers will be examined vis-à-vis battery durability, reliability, and safety. Market trends in Europe, the U.S., China, and Japan will be reviewed with the pace of market growth depending predominantly on governmental regulations and incentives, and battery pricing.

11:20 The Continuously Evolving Status of the Chinese xEV Market, and a Strategic Analysis of the Top Battery Companies
Mark Lu, Certified Senior Industrial Analyst, Industrial Economics & Knowledge Center (IEK), Industrial Technology Research Institute (ITRI)
Chinese xEV sales continue to grow rapidly. This growth in demand has constituted an equivalent growth in the demand for batteries, which has attracted overseas battery manufacturers. Therefore, this presentation will cover both updated market information and battery product comparisons. The market information part will focus on the effect of policies on demand within the Chinese xEV market; the battery product comparison part will look at present battery technical levels and differences in strategy among top battery manufacturers.

11:40 Present Status and Future Trend of LiB Cell and Material Market – How Manufacturers in Each Country/Region Should Do Business
Sachiya Inagaki, General Manager, Industrial Technology Unit, Yano Research Institute, Ltd.
Thanks to the expanding market of xEV, LiB cell and materials markets are also booming. Then, many manufacturers try to expand their production capacity in order to meet the demand from their customers. But do we really need that much? I will analyze and report how we should go through such a tough market situation based on our market research data and result.

12:00 pm Q&A

12:20 Networking Lunch *Sponsored by* A123 SYSTEMS

1:05 Dessert Break in the Exhibit Hall with Poster Viewing *Sponsored by* Ford

ADVANCED LEAD-BASED BATTERIES R&D ROADMAP

2:00 Chairperson's Opening Remarks
George Brilmyer, Ph.D., Co-Founder and Partner, HighWater Innovations

2:05 FEATURED PRESENTATION: Next-Generation EFB and AGM Technology to Support Growing Start-Stop Demand
Tom Watson, Vice President & Technical Fellow, Powertrain & Vehicle Systems, Johnson Controls
In the next five years, batteries in new vehicles will evolve in order to meet more stringent global emission regulations. The growing demand in performance

Cambridge EnerTech
A Division of Cambridge Innovation Institute

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Cambridge EnerTech
A Division of Cambridge Innovation Institute

for the next generation of EFB and AGM technology will be the focus of this presentation as well as solutions from new material development to improve key characteristics such as DCA (dynamic charge acceptance), cycle life and cranking capability at broad range of temperature.

2:25 ALABC-Innovation and R&D-Key Learnings for Future Automotive Applications
Boris Monahov, Ph.D., Program Manager, Advanced Lead-Acid Battery Consortium (ALABC) – a program of the International Lead Association (ILA)
Alistair Davidson, Ph.D., Director-Products and Sustainability, International Lead Association
There is a growing consensus of opinion which suggests that stop start technology will do more for vehicle exhaust emission reduction than pure EV and strong hybrid technology combined. This paper argues the case that lead-acid technology will win a major market share in both this market and the 12V micro-hybrid not just on price but on genuine improvements thanks to widespread use of negative plate carbon additives and better battery management systems. The paper will discuss the key results of past ALABC demonstration projects utilizing lead batteries in 12 and 48 V applications, conducted with companies such as Ford, Honda and Kia/Hyundai.

2:45 Sponsored Presentation *(Opportunity Available)*

3:05 Refreshment Break in the Exhibit Hall with Poster Viewing *Sponsored by*

AIV Power Cycling & Test Systems The Standard for Advanced Energy Testing

4:00 Advanced BMS Solutions for Automotive Battery Storage Systems with One or More Lead-Acid Batteries – The Key for Full Utilization of the System, Reduced Costs and Improved CO2 Savings
Grzegorz Pilatowicz, Technical Expert, Battery Management Systems, LEM Switzerland SA
This presentation focuses on a recent developments and solutions in the field of current sensing, smart battery sensors and BMS for lead-acid-based BSS, especially used in µH applications. It shows that synergy between software and hardware is a key enabler to develop dedicated solutions that reduce the system cost without any performance or safety compromises. Such dedicated and flexible innovations are believed to be an important step for a better and sustainable future.

4:20 Safe & Affordable Hybridization: Tailoring Lead Acid Battery Chemistry
Gordon Beckley, CTO, Hammond Group
Hammond Group, a global leader in developing and producing advanced active materials and additives for PbA batteries, has developed revolutionary HRPSoC performance improvements across a broad range of applications with minimal compromise on other key characteristics. These advances are helping to open the door for PbA in applications once dominated by Lithium-ion and other chemistries. In an effort to drive continuous improvement, Hammond has partnered with the Fraunhofer Institute to independently evaluate these new advances in real world test protocols.

4:40 Discrete Carbon Nanotube Additives for Advanced Automotive Lead-Acid Batteries
Jeremy Meyers, Ph.D., Director, Research and Development, Lead-Acid Batteries, Molecular Rebar Design
Discrete carbon nanotubes can be dispersed in an aqueous solution and added directly to the pasting mix for either negative or positive lead-acid battery plates. These additives markedly improve the ability for batteries to be charged quickly without gassing, and to withstand many characteristic cycling protocols. These nanotubes, known as MOLECULAR REBAR®, can easily be incorporated into existing pasting lines. They have yielded benefits in full-scale production batteries in automotive applications.

5:00 Q&A

5:20 Networking Reception in the Exhibit Hall with Poster Viewing *Sponsored by* TOYOTA

6:30 End of Day

THURSDAY, JUNE 22

8:30 am Registration Open

9:00 Continental Breakfast Roundtable Discussions
Join your colleagues and fellow delegates over breakfast for a focused, informal discussion moderated by a member of our speaking faculty. A small group format allows participants to meet potential collaborators, share examples from their own work and discuss ideas with peers. Visit our website to see the full listing of topics and moderators.

10:00 Coffee Break in the Exhibit Hall with Poster Viewing

TECHNOLOGY & INNOVATION: NEW BATTERIES

11:00 Chairperson's Remarks
Tom Watson, Vice President & Technical Fellow, Powertrain & Vehicle Systems, Johnson Controls

11:05 Physics-Based Modeling of New Thin-Plate Lead-Acid Batteries
Mikael Cugnet, Ph.D., Project Manager, CEA, France
Physical modeling is the most interesting way to model any battery technology, because it can provide useful information from design to end of service life. Lead-acid batteries are subject to various electrode reactions and the prediction of their performance requires a deep knowledge of the physics involved. In turn, physics-based models bring quantitative information regarding the limiting processes at play under specific operating conditions, which is of great interest to continuously push the limits.

11:25 Roles of the Auxiliary Application Lead Acid Battery
Aaron Bollinger, Product Engineer, East Penn Manufacturing
Small lead acid batteries (AUX) have been widely used under multiple cycle duties and applications. These batteries are able to offer excellent power, energy and life based on the design intent. Advances in lead acid technology

Online Registration Closes June 16!

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration

Click Here to Register Online!
AdvancedAutoBat.com/us

continue to improve the capability of these batteries. This presentation will look at the history of these batteries and show how the technology has transitioned in today's market. Finally, we will look at how these small batteries may play a key role in lead acid's future in automobiles.

11:45 A Geometrically Optimized VRLA Battery for 42Volt Mild Hybrid Applications
George Brilmyer, Ph.D., Co-Founder and Partner, HighWater Innovations
A Geometrically Optimized VRLA battery has been developed for use in hybrid electric vehicles. This low-profile, spiral-wound cell is designed to meet cost, performance and recycling targets for the growing 42V mild hybrid battery market. The key to the "GO Battery" technology is a low-aspect-ratio/low resistance grid. This design offers power levels that are 3-4X greater than commercially available VRLA technology thus leading to smaller and lighter battery packs. Several "GO Battery" HEV pack designs will be presented for comparison to existing battery pack size and weight targets.

12:05 pm Comparing and Contrasting Pb-Acid and Li-Ion Batteries
Linda Gaines, Ph.D., Transportation Systems Analyst, Argonne National Laboratory
There are major differences between lead-acid (Pb-acid) and Lithium-ion (Li-ion) automotive batteries. This presentation will highlight some of the advantages and disadvantages of each, with the hope that each can learn from the other and improve both. Aided by advanced research techniques, materials and designs are improving rapidly to provide enhanced performance. However, that means that chemistries are evolving so rapidly that materials might be entirely outdated by the time the batteries are available for recovery. These factors make planning for economical recycling difficult.

12:25 Q&A

12:40 Networking Lunch

1:05 Dessert Break in the Exhibit Hall with Poster Viewing

TECHNOLOGY & INNOVATION: DCA VS. HIGH TEMPERATURE DURABILITY

2:15 Chairperson's Remarks
Gerry Woolf, Owner and Publisher, Energy Storage Publishing Ltd.

2:20 Reengineering Lead for High Power and High DCA
Dan Moomaw, Mechanical Engineer, Engineering, Gridtential Energy
The automotive industry is moving quickly towards mass electrification of vehicles and requires low cost and high power energy storage solutions. Dynamic Charge Acceptance and high power experiments are underway and initial results are promising. With excellent mechanical robustness, two times higher energy density than monopolar lead batteries, Lithium-level power density, and cycling life that exceeds 3000 in deep discharge applications, Silicon Joule is breathing new life into the lead battery while maintaining a competitive cost structure.

2:40 Novel Negative Electrode for High DCA Performance
Stuart McKenzie, CEO, ArcActive, Ltd.
Car companies want a low cost battery that provides high and sustained Dynamic Charge Acceptance (DCA) to improve the Real World Emission performance of Micro Hybrid vehicles. ArcActive has developed a Carbon Fibre-based negative electrode, which displays high and sustained DCA but with low Water Consumption and will present the latest 3rd party battery level data on a variety of key performance attributes.

3:00 Graphene Nanomaterials Application in Lead-Acid Chemistry
Gui-ping Dai, Ph.D., Chief Scientist, Chaowei Power Company
Liya Wang, Ph.D., Vice President, R&D, XG Sciences
Robert M. Privette, Vice President, Energy Markets, XG Sciences
Lead-acid is the most widely employed rechargeable system with a 65% share of the battery market. Although the battery was invented over 150 years ago, research continues to enhance its performance in terms of rate capability, stability, cycle life and durability. The use of graphene is envisaged to offer further benefits given that it has high intrinsic electrical conductivity and also is extremely lightweight, chemically inert, and flexible with a large surface area. This presentation discusses the commercial application of graphene in a motive power lead-acid battery designed for e-bike duty.

3:20 Refreshment Break

3:40 New Carbon Additives for High DCA and High Temperature Durability Applications
Michael Mukai, Development Manager, Energy Materials, Cabot Corporation
Cabot is developing new PBX grades of carbon additives with controlled morphology and surface properties targeted to improve dynamic charge acceptance (DCA) and cycle life while maintaining high temperature durability of advanced lead acid batteries. The presentation will describe cell and battery level data demonstrating advantages of new grades in removing the tradeoffs observed previously for high surface area carbons.

4:00 PANEL DISCUSSION: Is Automotive Lead-Acid an Endangered Species? How Will Innovation Help to Maintain Market Share?
Moderator: Gerry Woolf, Owner and Publisher, Energy Storage Publishing Ltd.
Lead-based battery demand continues to grow worldwide despite the inroads being made from other battery chemistries such as Li-ion. The demand from the automotive industry is one of the key drivers to this market. This panel of experts will discuss the global lead-based market and it's prospects for growth and innovation.

4:20 Q&A

4:40 Closing Remarks

4:50 End of Conference

Cambridge EnerTech
A Division of Cambridge Innovation Institute

Online Registration Closes June 16!

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

Conference Hotel & Venue:
San Francisco Marriott Marquis
780 Mission Street
San Francisco, CA 94103
Marriott Reservations:
1-877-633-3056 (U.S.)
1-415-896-1600 (Intl.)

Reservations
Go to the travel page of advancedautobat.com/us

Discounted Room Rate: $299 s/d
Discounted Cut-off Date: May 23, 2017

Go to the travel page of advancedautobat.com/us for additional info.

Online Registration Closes June 16!

Cover
Welcome
Conference-at-a-Glance
Sponsorship & Exhibitors
Tutorials
Agenda
R&D Symposia
Chemistry
Engineering
Raw Materials
Conference Tracks
Plenary Sessions
xEV
Lead-Based
Hotel & Travel
Registration
Click Here to Register Online!
AdvancedAutoBat.com/us

REGISTRATION

ALL ACCESS PRICING *(Includes access to all tutorials, symposia, and conference tracks. Note: some tutorials, symposia, and conference tracks run in parallel.)*	**Commercial**	**Academic, Government**
Standard Registration after May 12	$2399	$2099

INDIVIDUAL SYMPOSIUM PRICING *(Includes access to one symposium, excludes conference tracks, and tutorials)*		
Standard Registration after May 12	$1299	$1099

INDIVIDUAL CONFERENCE PRICING *(Includes access to one conference track, excludes symposia and tutorials)*		
Standard Registration after May 12	$1799	$1549

PROGRAMS	
R&D SYMPOSIA | JUNE 19-20	CONFERENCE TRACKS | JUNE 21-22
S1: Chemistry	T1: xEV
S2: Engineering	T2: Lead-Based
S3: Raw Materials	

TUTORIALS		
One Tutorial	$300	$300
Two Tutorials	$550	$550

JUNE 19 | 8:00 - 10:00 AM	JUNE 19 | 10:30 AM - 12:30 PM
TUT1: The Rechargeable Battery Market: Value Chain and Main Trends 2017 – 2027	TUT4: Intelligent Transportation: Advances in Autonomous Transportation and Overcoming the Barriers to Consumer Acceptance – Part 2 of 2
TUT2: Recent Advances in Solid State Electrolytes for Energy Storage	TUT5: Battery Safety and Abuse Tolerance Validation
TUT3: Intelligent Transportation: Advances in Autonomous Transportation and Overcoming the Barriers to Consumer Acceptance – Part 1 of 2	TUT6: Materials for Next-Generation Batteries

Discounts

Group Discount (4 or more, must register at the same time)		15% Off
Poster Discount	$150 Off	$150 Off

If you are unable to attend but would like to purchase the Conference CD, visit the registration page of AdvancedAutoBat.com/us.

Twitter, LinkedIn, Facebook or any other promotional discounts cannot be combined.

"Not just the hype you sometimes get in purely research conferences."

– Stanley Whittingham, Ph.D.
Binghamton University

"It's really the whole ecosystem of the battery world. We find it extremely valuable."

– Ted Miller
Ford Motor Company

"It's a great conference; it has a super-high bandwidth. You can learn a lot about what's going on in the industry today."

– Mark Verbrugge, Ph.D.
General Motors R&D Center

Additional Registration Details:

Ways to SAVE! Group Discounts are Available! Special rates are available for multiple attendees from the same organization. For more information on group discounts contact Joseph Verange at 781-247-6263.

Poster abstracts are due by May 12, 2017. Once your registration has been fully processed, we will send an email containing a unique link allowing you to submit your poster abstract. If you do not receive your link within 5 business days, please contact **jring@cambridgeenertech.com**.

Please see website's poster page for more information about posters at AABC.