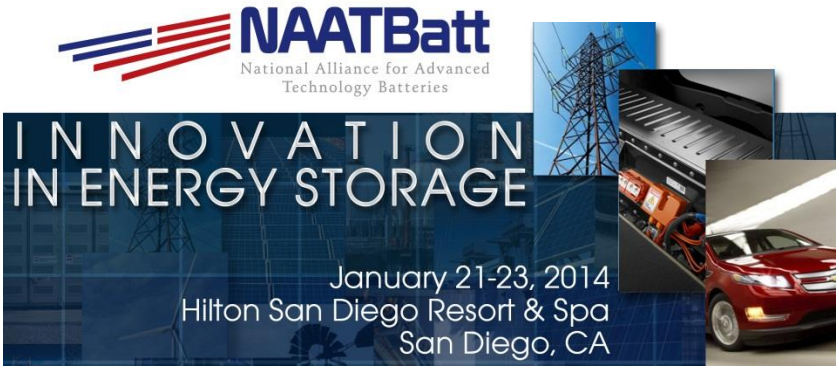

PROGRAM AGENDA

Unless otherwise indicated, all events will take place at the Hilton San Diego Resort & Spa, 1775 East Mission Bay Drive, in the Mission Bay district of San Diego.

Tuesday, January 21, 2014

Registration
12:30 – 3:30 p.m.

Speakers and Symposium delegates may pick up name badges and Symposium materials in the foyer of the Hilton San Diego Resort & Spa conference center

NAATBatt Members Meeting
1:00 - 1:30 p.m.

NAATBatt member firms are invited to participate in the Fourth Annual Meeting of the National Alliance for Advanced Battery Technologies (NAATBatt). New members of the Board of Directors will be elected by eligible members and the new officers and board will be announced. NAATBatt officers will report to the members on NAATBatt's activities over the past year.

Pre-Symposium Workshop: Graphene and its Applications in Energy Storage Technology
1:30 – 3:00 p.m.
Speakers:
Gary Economo, *Grafoid*
Dr. Gordon Chiu, *Grafoid*

Grafoid will present a 90-minute workshop on graphene and its applications in energy storage technology. Graphene and its derivatives are materials with exceptional properties such as outstanding electric and thermal conductivity, large specific surface area and a natural adhesiveness. Conventional and prospective battery materials are distinguishably enhanced when functionalized with graphene. This workshop will outline some of the remarkable properties and potentials of graphene in energy storage technology and discuss some of the challenges of its manufacture. The workshop will provide delegates with a "hands on" graphene experience and with an understanding as to why the scientists who isolated it received a Nobel Prize in 2010.

Break
3:00 – 3:30 p.m.

Network with the leaders in the advanced battery and electricity storage industries.

Buses Depart for Tours of UCSD Energy Storage Projects and the SDGE Energy Innovation Center
3:30 p.m.

Delegates will depart by bus from the lobby of the Hilton San Diego Spa & Resort to the University of California-San Diego campus and to San Diego Gas & Electric's Energy Innovation Center for presentations and tours of the latest in electricity storage technology.

3:50 – 5:30 p.m.	Delegates will tour electricity storage demonstration projects installed by UCSD at its East Campus, in the Hopkins Parking Facility and at the La Jolla Playhouse. Projects to be visited include demonstrations of fuel cells, ultracapacitors and lithium-ion batteries on the grid. Prof. Bill Torre will talk about what UCSD has learned from the projects and its plans for energy storage in the future.
6:00 – 7:00 p.m.	Delegates will visit San Diego Gas & Electric's Energy Innovation Center in San Diego, where John Holmes and other executives of SDGE will talk about its experience with electricity storage and its plans for the future. Delegates may explore the Energy Innovation Center on guided or self-guided tours.
7:00-7:45 p.m.	Reception for speakers and delegates at the SDGE Energy Innovation Center
8:00 p.m.	Buses return to the Hilton San Diego Resort & Spa from the Energy Innovation Center

Hawaiian "Luau" Reception for Speakers and Delegates
8:15 – 10:00 p.m.

Toast your poor colleagues who cannot be in San Diego in January at a pool-side Hawaiian buffet and reception for Symposium speakers and delegates. Fortify yourself for two days of advanced battery details with a Mai Tai or two before heading off to bed.

Wednesday, January 22, 2014

Registration and Continental Breakfast
7:00 – 8:00 a.m.

Registration will continue and a continental breakfast will be provided in the foyer of the conference center at the Hilton San Diego Spa & Resort

Welcome Remarks by NAATBatt Executive Director and Day Chair
8:00 – 8:10 a.m.
Day Chair: Pablo Valencia, *General Motors Company*

An Overview of Market Opportunities for Storage on the U.S. Power Grid
8:10 – 8:40 a.m.
Speaker: Judith Judson McQueeney, *Customized Energy Solutions*

Ms. McQueeney, the former Chairperson of the Massachusetts Public Utilities Commission, will present an overview of the market opportunities and policies that are leading to the commercial deployment of large scale storage projects on the U.S. power grid. Learn where the opportunities for storage on the grid are likely to be and when.

Energy Storage as an Enabler of Distributed Generation—A Case Study
8:40 – 9:10 a.m.
Speaker: Troy Miller*, S&C Electric*

Troy Miller, the Manager – Business Development, Power Quality Products of S&C Electric, will talk about how energy storage has been used to enable the deployment of distributed renewable generation onto the grid. Mr. Miller will explore some real world examples of where utilities have used electricity storage to help meet renewable generation mandates.

Advanced Batteries, Energy Storage and the Capital Markets
9:10 – 10:25 a.m.
Panelists: Michael Lew, *NAATBatt, moderator*
John Craig, *EnerSys*
Gregory Griffith, *OM Group*
Konrad Jarausch, *Passport Capital*
Scott Mulcahy, *XMS Capital Partners*
Ryan Aldridge, *JDR Capital Partners*

Who let the dogs out? After two years of being one of the most unpopular industries on Wall Street, batteries are poised for a comeback. Corporate CEO's and financial investors are actively looking for deals in the battery space. This panel will talk about why Wall Street is taking a new look at the battery business and what to expect as a consequence in the year ahead.

Break
10:25 – 10:50 a.m.

Network with leaders in the advanced battery and electricity storage industries.

Energy Storage Innovation Summit
10:50 – 12:30 p.m.
Chair: Chad Hall, *IOXUS*

Part of NAATBatt's mission is to promote the development of new energy storage technology by building ties among the emerging companies working with that technology and better established and better capitalized industry firms, which might be well positioned to bring that new technology to market. A selection committee of NAATBatt member firms has invited the following emerging companies to make "flash" presentations about their new technologies at the Meeting:

Ambri
Shamrock Energy
FastCAP Systems
Dreamweaver International
Altium Energy
Battery Innovation Center
Eos Energy Storage
Faraday Energy
Von Ardenne
Earl Energy
XG Sciences
XL Hybrids
Voltaiq
Porous Power Technologies
Design Flux Technologies
Meecotech
Princeton Power
Southern Energy Technology Institute
Spider9
Paper Battery Company

Lunch
12:30 – 1:45 p.m.

Eat and network with leaders in the advanced battery and electricity storage industries.

Progress in the Joint Center for Energy Storage Research, the U.S. DOE Advanced Battery Hub
1:45 – 2:15 p.m.
Speakers: Jeff Chamberlain, *Argonne National Laboratory, Joint Center for Energy Storage Research*
Norm Peterson, *Argonne National Laboratory*, *Joint Center for Energy Storage Research*

Last year, the U.S. Department of Energy awarded $125 million to Argonne National Laboratory to establish a national hub for advanced battery research. The mission of Argonne's Joint Center for Energy Storage Research (JCESR) is to enable advanced batteries to achieve five times their energy density, at one fifth the cost, within five years. One year into the project, how are things going? Hear first-hand from Jeff Chamberlain, the Assistant Director of JCESR.

Using IP Tracking to Predict Commercial Trends in Advanced Battery Markets
2:15 – 2:45 p.m.
Speaker: Kathryn Paisner, *IP Checkups*

One of NAATBatt's projects this past year has been to develop, in partnership with eight of our member firms and IP Checkups, an IT company located in Berkeley, California, a database of patents and patent applications relating to advanced battery and ultra-capacitor technologies. Kathryn Paisner of IP Checkups will demonstrate how the database can be used to predict trends in the advanced battery and ultra-capacitor markets. Kathryn will also make some surprising predictions about where companies are likely to see opportunity (and not) in the advanced battery and energy storage industries over the next five years.

Break
2:45 – 3:05 p.m.

Network with leaders in the advanced battery and electricity storage industries.

Managing Safety in ESS Projects
3:05 – 4:30 p.m.
Panelists: Dan Borneo, *Sandia National Laboratory, moderator*
Dan Cass, *GCube Insurance*
Laurie Florence, *UL LLV*
Chris Orendorff, *Sandia National Laboratory*
Davion Hill, *DNV GL*
Quinn Horn, *Exponent, Inc.*

With electricity stationary storage on the verge of explosive growth, safety has become a serious concern. A serious thermal incident could derail the emerging ESS market. Who is doing what to ensure that deployed ESS projects are safe and will not endanger power professionals, the electricity grid or the general public? Leaders in ESS safety issues will discuss where the industry is in terms of safety and where it is going. Safety concerns will impact everyone involved in ESS-related businesses. Hear from this panel what your business needs to know.

Growth of the U.S. Market for Electric Vehicles
4:30 – 5:00 p.m.
Speaker: Ralph Brodd, *Broddarp of Nevada*

Ralph Brodd, the CTO of NAATBatt, will present and review a recent report from the National Academy of Sciences analyzing expected growth in the market for electric vehicles in the United States from 2013 – 2050. The report outlines the NAS's prediction of long term market penetration by electric vehicles based on anticipated changes in EV technology over the next 35 years. The report identifies emerging opportunities in the EV sector for battery manufacturers and their supply chain partners.

Structurally Stable Magneli Phase (SSMP) Materials for Battery Applications
5:00 – 5:30 p.m.
Speaker: Dr. Steve Clarke, *Applied Intellectual Capital*

Dr. Steve Clarke will discuss Structurally Stable Magneli Phase (SSMP) materials, a new class of advanced battery materials. The term "Magneli Phase" denotes a structure of stacked planes, very similar to graphite. This delivers electrical conductivity, lubricity and corrosion resistance. It also allows for the injection, storage and removal of metal ions such as lithium. Earlier Magneli Phase titanium sub oxides such as Ti_4O_7 and Ti_5O_9, (which are often referred to as Ebonex™) were not stable at the nano-scale. Dr. Clarke will discuss a new class of SSMP materials, which are stable as nano-fibers, coatings, composites and ceramics.

Networking Reception
5:30 – 6:45 p.m.

Network and socialize with leaders in the advanced battery and electricity storage industries, sponsored by Focus Graphite.

6:45 – 8:45 p.m.
Gala Awards Dinner
Keynote Speaker: Dr. Mark Rosekind, Member of the National Transportation Safety Board

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the U.S. and significant accidents in other modes of transportation—railroad, highway, marine and pipeline. The NTSB determines the probable cause of each accident investigated and issues safety recommendations aimed at preventing future accidents.

Dr. Mark R. Rosekind was appointed to the National Transportation Safety Board (NTSB) on June 30, 2010, and serves as one of its five members. He has published more than 150 scientific, technical, and industry papers and has given hundreds of presentations to operational, general, and scientific audiences. His achievements have been acknowledged through numerous honors and awards, including NASA's Exceptional Service Medal; the Mark O. Hatfield Award for Public Policy from the American Academy of Sleep Medicine; six other NASA Group/Team Awards; two Flight Safety Foundation honors, the Presidential Citation for Outstanding Safety Leadership and the Business Aviation Meritorious Award; and Fellow of the World Economic Forum in Davos, Switzerland.

Advanced batteries are an important source of portable power, but come with risks. The FAA has recorded 33 cases of batteries brought aboard commercial planes by passengers or as cargo catching fire since 2009. Of those cases, 26, or 79 percent, involved lithium-based batteries. Member Rosekind will review the NTSB's findings concerning the safety of advanced batteries in various forms of transportation. His remarks will illuminate issues and challenges that may affect the advanced battery market in 2014.

Presentation of 2014 Annual Awards:

Each year at its annual meeting, NAATBatt recognizes individuals who have made outstanding contributions to the development of the advanced battery industry through innovations in science, business, policy initiatives and other areas. NAATBatt is pleased to present this year the following awards to two outstanding individuals:

Technology Development Award

Dr. Ralph J. Brodd is recognized for a lifetime of contributions to the science and business of advanced battery technology. A prolific author on the subject of lithium-ion battery technology, Ralph has worked in numerous capacities in government and industry and has served as a mentor to many of our industry's leaders today.

Market Development Award

Grid-connected energy storage may be the "killer app" that leads to explosive growth in the advanced battery industry. No one has done more than Janice Lin to develop a market for grid-connected energy storage. Janice's work in California, to promote AB2514 and the 1.3 gigawatt storage mandate resulting from it, was unquestionably the top energy storage story of 2013.

Thursday, January 23, 2014

Registration and Continental Breakfast
7:00 – 8:00 a.m.

Registration will continue and a continental breakfast will be provided in the foyer of the conference center at the Hilton San Diego Spa & Resort

Welcome Remarks by NAATBatt Executive Director and Day Chair
8:00 – 8:10 a.m.
Day Chair: Chester Burtt, *Focus Graphite*

Secondary Life of Automotive Lithium Ion Batteries: An Aging and Economic Analysis
8:10 – 8:50 a.m.
Speaker: Nick Warner**,** *The Ohio State University, Center for Automotive Research*

As electric vehicles penetrate the automotive market, so too will an influx of used cells no longer suitable for vehicles but potentially prime for second use in grid storage applications. Nick Warner of CARS will present an economic analysis of second use utility. The CARS study is the first based on actual experimental data concerning EV battery degradation; all previous studies have been based on extrapolation. Find out what experience with real EV batteries indicates as far as the feasibility of using second life EV batteries in ESS applications.

How ISP's Look At The California Storage Opportunity and Beyond
8:50 – 9:50 a.m.
Panel: Peter Thomas*, FIAMM S.p.A., moderator*
Praveen Kathpal, *AES Energy Storage*
Kris Zadlo, *Invenergy*
Damien Buie, *EDF Renewable Energy*
Paul Turner, *Hecate Energy*

The 1.325 gigawatt California storage mandate prohibits utilities from owning more than 50% of the storage capacity needed to satisfy the mandate. As a result, independent storage providers (ISP's) are likely to play a major role in the California storage market. Many of these project developers will have a lot of experience developing wind, solar and gas turbine power projects, but little understanding of storage. Many battery industry professionals know storage technology, but have little understand of how power projects are developed outside of utilities. Learn from the experienced power project developers on this panel about how ISP projects will work and what developers are looking for, and what they will expect, from their battery technology partners.

Break
9:50 – 10:15 a.m.

Network with leaders in the advanced battery and electricity storage industries.

NAATBatt Member Updates – Group 1
10:15 – 12:15 p.m.

NAATBatt member firms will have the opportunity to make a presentation about developments and accomplishments at their firm over the past year that should be of interest to meeting delegates. Each presenting firm will have 7 minutes and 4 slides to present its update. Half the presentations will be before lunch and half will be after lunch.

Lunch
12:15 – 1:30 p.m.

Eat and network with leaders in the advanced battery and electricity storage industries.

NAATBatt Member Updates – Group 2
1:30 – 3:30 p.m.

NAATBatt member update reports continue.

Closing Remarks and Adjourn
3:30 – 3:35 p.m.

Farewell Cocktail Reception
3:35 – 5:00 p.m.

EaglePicher™ Technologies, LLC

SPONSORS

GIGAWATT SPONSOR

Focus Graphite Inc. is an emerging mid-tier junior mining development company, a technology solutions supplier and a business innovator. It is the owner of the NI 43-101 compliant Lac Knife graphite deposit grading 16% carbon as graphite. The company's goal is to assume an industry leadership position by becoming a low-cost producer of technology-grade graphite. As a technology-oriented enterprise with a view to building long-term, sustainable shareholder value, Focus Graphite is invested in the development of graphene applications and patents through Grafoid Inc. Focus trades on the TSX-V under the symbol FMS and on the OTCQX in the U.S. under the symbol FCSMF. For more information, see: www.focusgraphite.com

BREAKFAST SPONSOR

S&C ELECTRIC COMPANY
Excellence Through Innovation

Building on its over 100 year heritage of innovation in power systems, S&C has become a pioneer in battery energy storage with over 17 operational projects totaling 150 MWh of stored energy. This experience includes the first storage projects used to help connect both wind and solar to the grid as well as projects used for islanding, peak shaving, frequency control, energy arbitrage, and in microgrids. S&C's PureWave® SMS and PureWave® CES use field-proven power electronics technology to control battery output and provide rapid response to changing system conditions in utility and community scale energy storage. Learn more at sandc.com.

LUNCH SPONSOR

EnerSys®
Power/Full Solutions

EnerSys® is the largest industrial battery manufacturer in the world, operating manufacturing and assembly facilities worldwide for customers in over 100 countries. EnerSys is uniquely positioned to provide expertise in designing, building, installing and maintaining a comprehensive stored energy solution for industrial applications throughout the world. The company's products and services are focused on three primary markets: Motive Power, Reserve Power and Aerospace & Defense. Motive Power applications include material handling, railway and mining equipment, while Reserve Power applications consist of telecommunications, datacenters, electronics, security, portable power, switchgear/utility, and sports and leisure. Aerospace & Defense applications include military planes, submarines and tactical vehicles. www.enersys.com

COCKTAIL SPONSOR

EaglePicher Technologies, LLC, an OM Group company, is a leading provider of technologically advanced products and solutions for critical energy storage applications in the aerospace, defense, medical, and alternative/grid energy storage markets. EaglePicher developed the Power Pyramid™ - a patented hybrid solution to manage the supply and demand of wind, solar and grid power. This approach surpasses conventional storage techniques by leveraging the potential of multiple storage technologies, minimizing the shortcomings typically associated with any single electrochemistry to provide optimized performance. Whether it's cutting-edge battery technology research or in mission-critical applications, EaglePicher continues its legacy of high reliability power systems.

TOTE BAG SPONSOR

ATL is a Hong Kong based international company leading in design, manufacture, sales and marketing of rechargeable lithium ion/polymer battery cells and related battery packs and systems. Our lithium battery products are widely used in consumer electronics products like laptop computers, smart/cellular phone, digital media players, digital cameras and camcorders, cordless tools and numerous favors of IT gadgets. In addition to the consumer electronics markets, ATL is advancing to electrical vehicles and electrical energy storage markets. Mission: Aims to be a premier solution provider for green energy storage. See: http://www.atlbattery.com

Exhibitors

Innovative line concepts for a profitable battery separator film production
Brückner Maschinenbau provides line concepts for an efficient, flexible and profitable production of battery separator film for Li-Ion-batteries used in portable electronic devices. Further on intense R&D is done on solutions for electric vehicles such as E-bikes, scooters and cars as well as stationary power storage applications. Brückner production lines with a film width of 4.2 m, an output capacity up to 30 million sqm/year and a film thickness range from 12 – 30 µm, stand for unmatched production efficiency, high yield, consistent film quality and highest safety standards.

The Center for Automotive Research (OSU CAR) is the preeminent research center in sustainable and safe mobility in the United States and an interdisciplinary research center in The Ohio State University's College of Engineering. OSU CAR research focuses on: advanced electric propulsion and energy storage systems; advanced engines and alternative fuels for reduced fuel consumption and emissions; intelligent transportation and vehicular communication systems; autonomous vehicles; noise, vibrations, and dynamics; vehicle chassis systems; and vehicle and occupant safety.

EboNEXT produces a range of electrically conductive and corrosion resistant materials for use in batteries and other electrochemical devices. These are "Magneli Phase" sub-oxides of titanium of the form $M_xTi_yO_z$ which are sometimes called Metal Titanates. The term "Magneli Phase" denotes a structure of stacked planes, very similar to graphite. This delivers electrical conductivity, lubricity and corrosion resistance. It also allows for the injection, storage and removal of metal ions such as Li. Earlier Magneli Phase titanium sub oxides such as Ti_4O_7 and Ti_5O_9, (which are often referred to as Ebonex™) are not stable at the nano-scale. Consequently it has been impossible to use Ti_4O_7 in the form of nano-structures or as thin film coatings. EboNext's materials are a new class of Structurally Stabile Magneli Phase (SSMP) materials which are stable as nano-fibers, coatings, composites and ceramics. Our materials are finding applications in a variety of battery and related products.

EnerSys® is the largest industrial battery manufacturer in the world, operating manufacturing and assembly facilities worldwide for customers in over 100 countries. EnerSys is uniquely positioned to provide expertise in designing, building, installing and maintaining a comprehensive stored energy solution for industrial applications throughout the world. The company's products and services are focused on three primary markets: Motive Power, Reserve Power and Aerospace & Defense. Motive Power applications include material handling, railway and mining equipment, while Reserve Power applications consist of telecommunications, datacenters, electronics, security, portable power, switchgear/utility, and sports and leisure. Aerospace & Defense applications include military planes, submarines and tactical vehicles. www.enersys.com

Focus Graphite Inc. is an emerging mid-tier junior mining development company, a technology solutions supplier and a business innovator. It is the owner of the NI 43-101 compliant Lac Knife graphite deposit grading 16% carbon as graphite. The company's goal is to assume an industry leadership position by becoming a low-cost producer of technology-grade graphite. As a technology-oriented enterprise with a view to building long-term, sustainable shareholder value, Focus Graphite is invested in the development of graphene applications and patents through Grafoid Inc. Focus trades on the TSX-V under the symbol FMS and on the OTCQX in the U.S. under the symbol FCSMF. See: www.focusgraphite.com

Ideal Power Inc. (NASDAQ: IPWR) has developed a novel, patented power conversion technology called Power Packet Switching Architecture™ (PPSA). PPSA improves the size, cost, efficiency, flexibility and reliability of electronic power converters. PPSA can scale across several large and growing markets, including solar photovoltaic generation, electrified vehicle charging, and commercial grid storage. Ideal Power has won multiple grants for its PPSA technology; including a $2.5 million grant from the Department of Energy's Advanced Research Projects Agency – Energy program, and market-leading customers are incorporating PPSA as a key component of their systems. For more information on Ideal Power, visit www.IdealPower.com.

K2 Energy is an innovative developer and manufacturer of cells, batteries and energy storage systems utilizing its proprietary K2|LiFePO4 chemistry. Our field-proven products offer industry-leading energy density, superior power, and are made of environmentally friendly, lightweight materials, providing increased cycle life and enhanced safety. From cells, to batteries, to large complex battery systems, K2 Energy's scientists and engineers have decades of combined experience researching, developing and bringing to customers next generation battery technologies. This commitment to innovation continues at the *K2 - Advanced Battery Laboratories* located at our Henderson, Nevada headquarters which feature cutting edge robotic automation, battery pack lines, research and development facilities.

Maccor Inc. was the pioneer, and is the world's largest commercialmanufacturer of automated test systems for a wide range of energy storage devices (i.e. batteries, capacitors, fuel cells, etc.) and device chemistries. In addition to standard cycling, drive cycle tests (i.e. FUDS, HPPC, US06 Drive Profile, etc.), sophisticated electrochemical experiments (i.e. cyclic voltametry, GITT Testing, PITT Testing, etc.), and high-speed pulse testing Maccor systems can perform impedance spectroscopy experiments in conjunction with a Solartron Analytical or Princeton Applied Research frequency response analyzer as well as temperature cycling experiments in conjunction with a Maccor temperature chamber. The test systems can also be configured with optional SMB and CAN communication hardware to allow interfacing with battery BMS systems.

Maccor also supplies cell formation equipment for a variety of cell formats and sizes. Today Maccor has over 1,700 systems in more than 50 countries with local sales and customer support services available in many areas.

MCV Energy, Inc. (MCV) founded in 2009 designs, manufactures and markets energy storage and power distribution systems for commercial, industrial and utility applications. MCV integrates the safety of lithium-ion battery with power electronics to deliver reliable and high performance energy storage capable of optimizing Volt/VAR management. MCV DESS accomplishes round-trip charge and discharge cycle in 150 micro-seconds. MCV DESS offers multiple control function options:

- Peak Load Management;
- Frequency Regulation;
- PV Voltage Transient Support and Intermittency Smoothing;
- Constant Power Charge and Discharge;
- Reactive Power; and,
- Remote control monitoring.

MCV DESS have compact footprint and deliver long life expectancy from large format prismatic lithium- ion battery. From 35kW/35kWh rack mounted unit (24”W x 36”D x 62”H) scalable to multi-megawatt container system, MCV DESS innovation is giving rise to a new vision to offer fully integrated renewable energy micro-grid solution with seamless transition between grid-tied and micro-grid within few milliseconds.

Building on its over 100 year heritage of innovation in power systems, S&C has become a pioneer in battery energy storage with over 17 operational projects totaling 150 MWh of stored energy. This experience includes the first storage projects used to help connect both wind and solar to the grid as well as projects used for islanding, peak shaving, frequency control, energy arbitrage, and in microgrids. S&C’s PureWave® SMS and PureWave® CES use field-proven power electronics technology to control battery output and provide rapid response to changing system conditions in utility and community scale energy storage. Learn more at sandc.com.