NABCEP
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CONFERENCE
March 21-23, 2017 Dallas, TX

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Dan Vance,
Sales Operations, BayWa r.e. Solar Systems

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March 21, 2017

Dear NABCEP Conference Attendee,

It is my pleasure to warmly welcome you to the 2017 NABCEP Continuing Education Conference.

This year BayWa r.e. is the proud Platinum Sponsor of the Conference. Why are we choosing to align ourselves closely with this event? There are several reasons:

- ***Local and regional installation companies are the heart of the solar industry***. We are here to empower, inform, and support the success of local and regional installers. In this way our goals and NABCEP's are closely aligned.
- ***Quality in the solar industry matters***. NABCEP, its certificants, and the sponsors, exhibitors and attendees of its Conference have a dedication to quality that differentiates us from the the rest of the industry. I would even say we have a tacit responsibility to lead the industry in reliability and integrity. Supporting the NABCEP Conference is one way in which we invest together in the long-term health of the industry.
- ***NABCEP community members support one another through incredible rates of change***. Technology, business models, and policy are all in flux. This conference gives us a unique opportunity, in the classrooms and in the hallways, to share our challenges, best practices, and ideas. This spirit of collaboration among NABCEP certificants is a port in the storm with which we resonate, and a resource upon which we all draw for the health of our businesses.

We look forward to spending the conference learning together, and getting to know one another better. We are grateful to engage with you in this venue.

All the best,

Boaz Soifer, CEO
boaz.soifer@baywa-re.com

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On behalf of the NABCEP Staff and Board of Directors, I would like to personally welcome you to the Sixth Annual NABCEP Continuing Education Conference. I was honored to be selected by the NABCEP Board of Directors as the new Executive Director. I am new to the renewable energy industry, so I look forward to meeting as many of you as possible during the conference so I can hear your needs, and discuss how NABCEP can assist in sustaining the growth of the industry, as well as making your personal journey as rewarding as possible.

A lot has changed since the last conference. How we embrace the change can impact the future. We can either influence the change, or be influenced by the change. Benjamin Franklin once said, "When you're finished changing, you're finished." NABCEP, like you, is committed to industry growth and therefore has been diligent in its work to be an influencer.

One of the NABCEP changes you may have noticed is the launch of the rebranded Entry Level Program as the NABCEP Associate Program. The change wasn't in name alone. The NABCEP Associate Program now includes an experienced-based pathway, which allows those with appropriate experience to be eligible to sit for the exam. In the coming months you will see several other changes/additions in the NABCEP credential programs. Very soon you will see the launch of the PV and Solar Heating System Inspector Credentials, followed by the launch of three new PV Specialty Credentials in Design, Installation, and Commissioning and Maintenance. These changes reflect NABCEP's goal of listening to you, finding solutions to issues, and influencing change. So, we would like to thank you for assisting NABCEP in being a change maker.

We are excited to bring you four days of high quality content and presenters. Beginning with the 2017 keynote address by Rue Phillips on "Capturing and Refining the Renewables Service Market", and ending with the always informative full day courses. In between you will have the opportunity to learn about current best practices from some of the most qualified experts in their field. The presenters will address changes occurring in areas such as PV Codes and Standards, Utility Rate Structures, Energy Storage, and Financing Options. These changes not only impact how you conduct business, but also map the direction of the industry. I would like to thank the 2017 NABCEP Conference Committee for the work they did to ensure that every Panel Session was what you wanted. We value your input, and I am confident that you will find the sessions to be relevant to the latest technology and trends. So whether you are a NABCEP Certified Professional, working towards certification, or an employee of a NABCEP Accredited Company, there will be plenty to choose from as you continue your career path in the industry.

I would like to thank our sponsors, exhibitors, and media partners for their generous contributions and support of the 2017 NABCEP Continuing Education Conference. NABCEP enjoys an ongoing relationship with these partners throughout the year. Their commitment to the industry is exhibited by their sustained support of NABCEP, which not only allows NABCEP to bring you the best continuing education conference in the industry, but supports NABCEP's commitment to provide quality credentialing and accreditation programs. Please help us thank them by stopping by their exhibit booths. It will give you a chance to learn what is trending, meet old friends, and/or make new friends. You can also participate in the NABCEP Treasure Hunt while you are visiting. We would like to recognize and thank BayWa r.e., this year's Platinum Champion Sponsor (see page 3), for supporting NABCEP and the profession. To all of you, thank you again for joining us this year. Please stop by the NABCEP Booth to say hello, and please don't hesitate to stop me on the exhibit floor, in the hallway or on elevator to say hello and let me know how NABCEP can advance your journey.

Regards,

Shawn W. O'Brien
Executive Director

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KEYNOTE PRESENTATION

MONDAY, MARCH 20, 2017
6:00PM to 7:00PM
Malachite Showroom
Sponsored by BayWa r.e.

Rue Phillips is the CEO and co-founder of 365-Pronto and is a recognized leader and veteran in the solar, electric vehicle (EV) and renewable technologies industries with more than 30 years of experience. Most recently, Rue was the CEO and Co-Founder of True South Renewables, Inc., achieving rapid growth and considered the largest US independent solar O&M service provider, and President of Solarrus Corporation, an alternative energy services company, where he achieved year-over-year double digit growth earning them Fastest Growing Company four years in a row. He is also a longstanding leader in EV infrastructure and support technologies, having installed the first GM EV1 private Electric Vehicle Service Equipment (EVSE). As a sought-after adviser and industry expert, Rue is a consultant for Fortune 50 clients and frequent industry event keynote and technical speaker, and serves on multiple expert advisory committees for the development of codes and standards for the US solar industry (NREL. EPRI, ASTM, IEC).

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Conference Schedule

Monday, March 20, 2017

12:00 - 6:00 pm	Exhibitor Move-In		
4:00 - 8:00 pm	Registration Open	Crystal Foyer	
6:00 - 7:00 pm	Opening Keynote - Presented by Rue Phillips	Malachite Showroom	Sponsor: BayWa r.e. renewable energy
7:00 - 9:00 pm	Welcome Reception	Malachite Showroom	Sponsor:

Tuesday, March 21, 2017

7:00 - 8:00 am	Continental Breakfast	Crystal Ballroom I-V Exhibit Hall	Sponsor: APsystems
7:00 am - 6:00 pm	Conference Registration	Crystal Foyer	

CLASSROOMS	Baccarat	Lalique I	Lalique II	Colonnade A	Colonnade B	Spectrum A	Spectrum B	Waterford A	Waterford B
8:00 - 9:30 am Technical Training Sessions	Design and Install with CertainTeed Solar — CertainTeed Solar	Microinverters in the Residential Environment- APsystems YC500 Dual Module Solution — APsystems	Schneider Conext for Lithium Ion and Advanced Battery Solutions — Schneider Electric	Design Considerations for PV racking on Commercial Flat Roofs — Unirac, Inc.	Battery 101: Flooded vs. AGM vs. GEL — Trojan Battery Company	Making Solar More Accessible Through Innovation — SolarRoofHook	Photovoltaic Performance Monitoring with Solar-Log — Solar-Log	DC and AC Coupled Solar Storage Solutions — Magnum Energy	Installing the Pika Energy Island for simplified grid-tied solar with optional battery storage — Pika Energy

9:30 - 10:00 am	MORNING BREAK	Crystal Ballroom 1-V Exhibit Hall	Sponsor: APsystems

CLASSROOMS	Lalique Ballroom II	Crystal Ballroom VI	Crystal Ballroom VII	Crystal Ballroom VIII
10:00 - 12:00 pm Panel Sessions	**Data Acquisition, Energy Monitoring and Fleet Management Platforms** Sponsored by Morningstar. Moderator: Andrew Truitt, Dividend Solar. INVITED PANEL: Gabe Abbott, Locus Energy; Shavaj Kallamkote, CarbonTRACK; Erik Norwood, Curb; Alison Hyde-Adams, Also Energy; Jake Whiteley, RadianGen; Brad Berwald, Morningstar	**Major Updates in PV Codes and Standards** Sponsored by Rolls Battery Engineering. Moderator: Rebekah Hren, Solar Energy International. INVITED PANEL: Steve Higgins, Rolls; Jason Fisher, Solar City; Bill Brooks, Brooks Engineering; Ryan Mayfield, Renewable Energy Associates	**Case studies – Energy Storage and Rule 21 Advanced Inverter Functions** Sponsored by Enphase Energy. Moderator: Brian Lydic, Fronius USA. INVITED PANEL: Greg Smith, Sonnen; Emily Hwang, Solectria; Blair Reynolds, Enphase; Jason Bobruk, SolarEdge Technologies	**Selling More Solar - the Role of Financing** Sponsored by Mitsubishi. Moderator: Geoff Greenfield, Third Sun Solar. INVITED PANEL: Chris Doyle, Dividend Solar; Jake Hoppe, Spruce Finance; G.P. Caminiti, Mitsubishi

12:00 - 1:30 pm	NETWORKING LUNCH	Crystal Ballroom 1-V Exhibit Hall	Sponsor: APsystems

CLASSROOMS	Baccarat	Lalique I	Lalique II	Colonnade A	Colonnade B	Spectrum A	Spectrum B	Waterford A	Waterford B
1:30 - 3:00 pm Technical Training Sessions	Solar Mounting, Codes and Best Practices — Quick Mount PV	Designing and Installing Enphase IQ Microinverter Systems — Enphase Energy	Energy Storage - Battery Bank Sizing, Care & Troubleshooting — Rolls Battery Engineering	Rapid Shutdown Systems (RSS) for Residential Solar PV Installations — PROINSO	Complying with Arc Fault & Rapid Shutdown Requirements — Yaskawa - Solectria Solar	Rapid Shutdown 2.0: What You Need to Know for 2017 and Beyond — OutBack Power Technologies	Advanced Ground Mount and Pitched Roof — IronRidge, Inc.	Master Class in Knees (the IV Curve Kind of Course) — Interplay Learning	Techniques for Discovering Useful Information from Energy Meter Data — eGauge Systems, LLC

3:00 - 3:30 pm	AFTERNOON BREAK	Crystal Ballroom 1-V Exhibit Hall	Sponsor: APsystems

CLASSROOMS	Lalique Ballroom II	Crystal Ballroom VI	Crystal Ballroom VII	Crystal Ballroom VIII
3:30 - 5:30 pm Panel Sessions	**Future Business Structure for Solar Installers** Sponsored by BayWa r.e. Moderator: Barry Cinnamon, Spice Solar. INVITED PANEL: Jeff Wolfe, GroSolar; Pamela Cargill, Chaolysti; Gary Gerber, Sunlight and Power	**Rapid Shutdown Requirements and Solutions** Sponsored by SolarEdge. Moderator: Ward Bower, Ward Bower Innovations, LLC. INVITED PANEL: Bill Brooks, Brooks Engineerng; Jason Fisher, SolarCity; Isaac Opalinsky, SunPower; Jeff Spies, Quick Mount PV; Jason Bobruk, Solar Edge	**Energy Storage – Learning a New Language** Sponsored by Enphase Energy. Moderator: Ezra Auerbach, DSC Consulting. INVITED PANEL: Tristan Kreager, Kreager Solar Associates; Steve Higgins, Rolls Battery Engineering; Greg Smith, sonnen Inc.; Neal Roche, Aquion; Blair Reynolds, Enphase	**Improving System ROI through Best Practices in Solar PV System Design, Installation, Monitoring, and O&M** Sponsored by APsystems. Moderator: Rudy Saporite, IBTS. INVITED PANEL: Brian Mehalic, Solar Energy International; Jeff Gilbert, Azimuth Solar Training; Doug Soester, Dividend Solar; Chris Barrett, APsystems

5:30 - 8:30 pm	NETWORKING RECEPTION/DINNER - Crystal Ballroom I-V Exhibit Hall	Sponsor: Mitsubishi Electric Solar Innovations
8:30 - 9:30 pm	Jeff Spies "Pioneers of PV — the Documentary" Lalique I	

Wednesday, March 22, 2017 Conference Schedule

7:00 - 8:00 am Continental Breakfast — Crystal Ballroom I-V Exhibit Hall — Sponsor: BayWa r.e. renewable energy

7:00 am - 6:00 pm Conference Registration — Crystal Foyer

CLASSROOMS	Baccarat	Lalique I	Lalique II	Colonnade A	Colonnade B	Spectrum A	Spectrum B	Waterford A	Waterford B
8:00 - 9:30 am Technical Training Sessions	Many Ways to Proof the Roof and Stand and Land with SunModo Racking — SunModo Corp.	Optimize Your PV Business with SolarEdge — SolarEdge Technologies	Get Off the Roof Faster! Learn Installation Practices — Unirac, Inc.	Intelligent Energy Storage - An Overview of Batteries, Applications and Installation — sonnen, Inc.	Remote Monitoring of Your Off-grid Power systems — Morningstar Corporation	Aqueous Hybrid Ion (AHI) Battery Product Training Seminar — Aquion Energy	WILEY - Solar Solutions for Grounding, Bonding & Wire Management — Burndy, LLC (Wiley)	The Perfect Combination: RoofTop Solar and Metal Roofing — S-5!	Designing and Installing Enphase Energy Storage Systems — Enphase Energy

9:30 - 10:00 am MORNING BREAK — Crystal Ballroom 1-V Exhibit Hall — Sponsor: BayWa r.e. renewable energy

CLASSROOMS	Lalique Ballroom II	Crystal Ballroom VI	Crystal Ballroom VII	Crystal Ballroom VIII
10:00 - 12:00 pm Panel Sessions	**Residential Roof Racking Systems – Rail vs Rail-less and BIPV** **Sponsored by SnapNrack** Moderator: Roger Williams, Solar Energy International INVITED PANEL: Kate Collardson, Certainteed; Barry Cinnamon, Spice Solar; Johan Alfsen, Quickmount PV; Edgar Becerra, Mitsubishi, Greg McPheeters, SnapNrack	**UL 2703 – PV System Bonding/ Grounding and Fire Classification** **Sponsored by APsystems** Moderator: Jeff Spies, Quick Mount PV INVITED PANEL: James Cormican, RBI; Dustin Haddock, S-5; Klaus Nicolaedis, Unirac	**Connecting Business Strategy to NABCEP Key Job Tasks** **Sponsored by BayWa r.e.** Moderator: Boaz Soifer, BayWa r.e. Solar Systems, LLC INVITED PANEL: Mike Teresso, Baker Electric Solar; Gary Gerber, Sunlight and Power; Chad Waits, Net Zero Solar; August Goers, Luminalt Solar	**Community Solar Industry Overview and Insights** **Sponsored by Mission Solar Energy** Moderator: Andrew Truit, Dividend Solar INVITED PANEL: Beth Copanas, GRID Alternatives; Dan McIlroy, Clean Energy Collective; Walter Sharp, Sharper Energy Technologies; Julia Sullivan, Stion, Odette Mucha, DOE/SunShot; Trevor Udwin, Mission Solar Energy

12:00 - 1:30 pm NETWORKING LUNCH — Crystal Ballroom 1-V Exhibit Hall — Sponsor: BayWa r.e. renewable energy

CLASSROOMS	Baccarat	Lalique I	Lalique II	Colonnade A	Colonnade B	Spectrum A	Spectrum B	Waterford A	Waterford B
1:30 - 3:00 pm Technical Training Sessions	MidNite Solar's Rapid Shutdown System — MidNite Solar	Commercial Three Phase Microinverter Solutions - Includes Design for Communication — APsystems	Solar Array Design for Commercial Buildings — ISA Corp.	Energy Storage - Battery Bank Sizing, Care and Troubleshooting — Rolls Battery Engineering	Fronius SnapInverter Installation Best Practices — Fronius USA	Making Commercial 3-phase a Snap: OutBack Power's ProHarvest Series as a New Business Opportunity — OutBack Power Technologies	Panasonic HIT Solar Modules: Superior Generation, Unmatched Reliability — Panasonic	PV Mounting in Asphalt Pitched Roofs Best Practices and Code with Rail-less RT-[E] Mount® — Roof Tech, Inc.	System Design and Optimization with HelioScope — Folsom Labs, Inc.

3:00 - 3:30 pm AFTERNOON BREAK — Crystal Ballroom 1-V Exhibit Hall — Sponsor: BayWa r.e. renewable energy

CLASSROOMS	Lalique Ballroom II	Crystal Ballroom VI	Crystal Ballroom VII	Crystal Ballroom VIII
3:30 - 5:30 pm Panel Sessions	**Calculating Payback in a Post NEM Market** **Sponsored by Intersolar** Moderator: Jeff Spies, Quick Mount PV INVITED PANEL: John Berdner, HiQ; Corey Garrison, Southface Solar Electric; Michael Bishop, OnGrid, Inc.	**Best Practices for Maximizing Software Investments** **Sponsored by Folsom Labs** Moderator: Pamela Cargill, Chaolysti Management Consulting INVITED PANEL: Connor English, PVBid; December Cowen, Unirac; Galina Kofchock, Osceola Energy; Paul Grana, Folsom Labs	**Battery Chemistries and System Options - Components or Prepackaged Systems** **Sponsored by Rolls Battery Engineering** Moderator: Catherine Kelso, Ambassador Energy INVITED PANEL: Steve Higgins, Rolls; Greg Smith, Sonnen; Sandra Herrera, Outback Power; Kyle Bulger, Blue Planet Energy	**PV Installer Safety** **Sponsored by BayWa r.e.** Moderator: Brian Mehalic, Solar Energy International INVITED PANEL: Guy Snow, G&G systems; David del Vecchio, SEI

5:30 - 8:30 pm NETWORKING RECEPTION/DINNER — Crystal Ballroom 1-V Exhibit Hall — Sponsor: ENPHASE

Conference Schedule

Thursday, March 23, 2017

7:00 - 8:00 am	Continental Breakfast		Crystal Ballroom I-V Exhibit Hall	Sponsor: inter solar NORTH AMERICA
7:00 - 9:00 am	Conference Registration		Crystal Foyer	
CLASSROOMS	**Lalique Ballroom II**	**Crystal Ballroom VI**	**Crystal Ballroom VII**	**Crystal Ballroom VIII**
8:00 - 11:30 am	**PV and the 2014/2017 updates (NEC) National Electric Code** Ryan Mayfield, Renewable Energy Associates	**PV with Energy Storage for Residential Applications** Roger Williams and Rebekah Hren, Solar Energy International	**Economics of Solar** Michael Bishop, OnGrid, Inc.	**PV Systems Maintenance and Trouble Shooting** David del Vecchio and Brian Mehalic, Solar Energy International
9:30 - 10:00 am	MORNING BREAK		Crystal Ballroom 1-V Exhibit Hall	Sponsor: inter solar NORTH AMERICA
11:30 am - 1:00 pm	NETWORKING LUNCH		Crystal Ballroom 1-V Exhibit Hall	Sponsor: inter solar NORTH AMERICA
1:00 - 4:00 pm	Exhibitor Move Out			
CLASSROOMS	**Lalique Ballroom II**	**Crystal Ballroom VI**	**Crystal Ballroom VII**	**Crystal Ballroom VIII**
1:00 - 4:30 pm	**PV and the 2014/2017 updates (NEC) National Electric Code** Ryan Mayfield, Renewable Energy Associates	**PV with Energy Storage for Residential Applications** Roger Williams and Rebekah Hren, Solar Energy International	**Closing the Loop to Improve Profitability and Efficiency** Conner English, PVBid	**PV Systems Maintenance and Trouble Shooting** David del Vecchio and Brian Mehalic, Solar Energy International
2:30 - 3:00 pm	AFTERNOON BREAK		Crystal Foyer	Sponsor: inter solar NORTH AMERICA
4:30 pm	Conference Adjournment - Thank You for Attending NABCEP's 6th Annual CE Conference. Have A Safe Journey Home!			

THE APP
FOR NABCEP'S CONFERENCE IS HERE!

NABCEP's CE Conference is going mobile with an event app! We teamed up with CrowdCompass to build an app that will make this year's experience a lot more valuable for our attendees, exhibitors, and speakers. This app includes networking, schedules, social media and much more in the palm of your hand.

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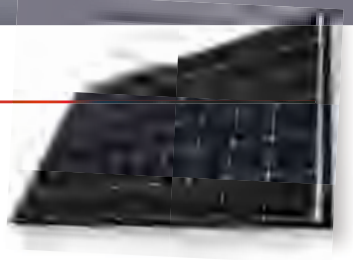

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Exhibitor Listing

AEE Solar
Booth # 314

For over 35 years, AEE Solar has delivered the products, training and support our customers need to succeed. We work with top manufacturers to introduce you to the latest tools and technology that help you run your business more efficiently and profitably. www.aeesolar.com

Allied Building Products
Booth # 17

The Solar Division of Allied distributes PV panels, inverters, rail, mounting hardware and accessories to solar contractors and installers. We provide our customers with dedicated solar sales professionals, jobsite and rooftop delivery capabilities, flexible financing programs, personal service, and competitive pricing. Our stock of solar material is among the largest in the country. We also have nationwide, warehouses and vehicles which can be used to service special solar delivery needs. We stock SolarEdge, SMA, Fronius, Enphase, Solectria, Ironridge, Unirac, Panasonic, Hyundai, SolarWorld, Hanwha Qcells, Quickmount PV, Ecofasten, S-5!, and many other products to provide you with a complete solution for your PV project needs.

APsystems
Booth # 215/216

Since its founding in Silicon Valley in 2009, APsystems has emerged as an industry leader through innovative solar products including dual-module microinverters and the first true 3-phase, four-module unit. APsystems ranked no. 2 in global market share among microinverter suppliers by shipments in 2014 (source: GTM Research). APsystems USA has offices in Cupertino, Calif., and Seattle, with manufacturing in Washington state. The company also maintains offices in China, the Netherlands, and Australia. www.APsystems.com

Aquion Energy
Booth # 317

Aquion Energy manufactures clean and sustainable saltwater batteries that outlive and outperform traditional battery chemistries. www.aquionenergy.com

BayWa r.e. Renewable Enery
Booth # 213/214

BayWa r.e. Solar Systems is a national solar distributor dedicated to supporting local, independent installers – the foundation of a robust and healthy solar industry. We offer only a select group of best-in-class products coupled with unrivaled customer support. Our strong global presence and our focus on creating meaningful, long-lasting partnerships, soundly positions BayWa r.e. Solar Systems to support our growing network of partners well into the future. http://us.baywa-re.com/en/

Burndy, LLC (Wiley)
Booth # 311

As the solar industry's technology continues to advance at a rapid rate, Wiley and BURNDY lead the way with a commitment to innovation and quality solutions. Industry-leading companies specify the Wiley family of products more often than any other brand in projects. The Wiley engineers work closely with solar manufacturers and installers to develop products that address the evolving needs of the PV industry in bonding, grounding, and wire management. www.burndy.com

CertainTeed
Booth # 219

CertainTeed is a leading North American manufacturer of building materials including roofing, solar, vinyl siding, trim, fence, railing, decking, insulation, gypsum, and ceilings products. CertainTeed offers a portfolio of unique solar products and systems. From the clean lines of the integrated Apollo II series, to the confidence of a 110+ year old company backing your products and installation workmanship, CertainTeed Solar has you covered. www.certainteed.com

Chint Power Systems America
Booth # 309

CPS America launched in 2012 under the umbrella of Chint Group, a $6B energy focused industrial firm - sometimes called the "GE of Asia". CPS championed 3-phase string inverter architecture in America for commercial and industrial PV applications. Excellent supply chain and engineering created the best cost/performance optimized inverters for the American market. The CPS line of 14-60kW inverters earned #1 market share in the USA by 2015 (GTM Research). www.chintpowersystems.com

eGauge Systems, LLC
Booth # 304

The eGauge energy meter displays real-time data for renewable energy systems, utility feeds, and electricity consumption of sub-panels, circuits, and equipment. The hardware features a 30-year datalogger, built-in web server, and ports for 12 current transformers. Communication options include Ethernet and PLC. There are no subscription fees for the eGauge platform, which makes it a very cost effective way to control and own your data. www.egauge.net

Enphase Energy
Booth # 300

Enphase Energy, a global energy technology company, is leading the charge to bring smart, connected solar energy to every home, business and community. The company delivers simple, innovative and reliable energy management solutions that advance the worldwide potential of renewable energy. Enphase has shipped approximately 10 million microinverters, and over 370,000 Enphase residential and commercial systems have been deployed in more than 95 countries. www.enphase.com

Folsom Labs, Inc.
Booth # 218

Folsom Labs makes HelioScope, the industry-leading sales and engineering toolkit for solar installers. Companies of all sizes use HelioScope to design and deploy high-quality solar arrays for both residential and commercial systems. HelioScope is easy to learn, fast to use, with CAD-caliber layout tools and fully-bankable energy yield calculations. www.folsomlabs.com

Fronius USA
Booth # 100

Fronius USA is the technology leader in the solar inverter industry, with a full product line that offers the flexibility necessary to fulfill all the power conversion needs in solar: from the small family home to the largest of commercial facility or solar farm. Fronius USA develops and innovates products based upon the principle of 24 hours of sun: a world powered by 100% renewables. www.fronius-usa.com

Ginlong Solis
Booth # 10

Ginlong Solis is one of the oldest and largest global string inverter specialists since 2005, who offers a complete product line of ultra-reliable, bankable, cost effective and innovative string inverter technologies for residential, commercial and utility scale solar markets and deliver significant long-term Return on Investment for stakeholders.

Huawei
Booth # 104

Huawei is a global leader of information and communications technology (ICT) solutions. Continuously innovating based on customer needs, we are committed to enhancing customer experiences and creating maximum value. Our ICT solutions, products, and services are used in more than 170 countries and regions, serving over one-third of the world's population. Huawei achieved global revenue of $74.9B USD in 2016, representing 32% revenue growth from 2015.

Interplay Learning
Booth # 211

Interplay Learning has developed the Solar3dSim, which is a Residential Troubleshooting Course providing 12 Hours of approved NABCEP training. The simulation progresses you through troubleshooting over 60 faults on four different system types. This simulation was built in conjunction with NYSERDA, and is the first of its kind in the solar industry to use simulation based learning to improve your and your team's effectiveness in the field. Please come by and see the future of solar training. www.solar3dsim.com

Exhibitor Listing

IronRidge, Inc.
Booth # 319

IronRidge designs and manufactures structural hardware for residential and commercial solar systems. For nearly 20 years, we have worked closely with solar professionals across the globe to build products that are strong, simple and cost-effective. http://www.ironridge.com

ISA Corp.
Booth # 204

ISA Corporation manufactures racking systems for commercial rooftops and for parking structures. The CSS Racking has the fewest number of posts/penetrations and the WSS Racking is a Trellis style that allows the array to be elevated to eliminate shading and allow easy access for re-roofing. All systems are customized to conform to the specific roof shape. Racking quotes include 3D layouts of the racking/array on the specific building. www.isa-corporation.com

Locus Energy
Booth #14

Locus Energy is a solar monitoring and data analytics platform provider for the solar photovoltaic (PV) market spanning the residential, commercial, and utility sectors, with over 128,000 systems deployed across North America. Locus Energy's cloud-based software aggregates, organizes, and analyzes performance data from multiple sources, making it easier to access, manage, and identify the causes of a solar system's failure to meet performance expectations. With a deep intellectual property portfolio, Locus Energy provides many of the largest utilities, capital providers, equipment manufacturers, and asset managers with sophisticated software to track performance across large portfolios of solar installations. Locus Energy's corporate headquarters are in Hoboken, NJ, and its technology headquarters are in San Francisco, CA. Locus Energy is an affiliate of Genscape, the premier global commodity and energy information Services Company. For more information on Locus Energy, please visit: www.locusenergy.com <http://www.locusenergy.com>

Magnum Energy
Booth # 105

Magnum Energy is a leading manufacturer of premium inverter/chargers for Renewable Energy applications. Shipped worldwide, our products use the highest quality components to respond to the extreme conditions of variable climates. For reliable power regardless of grid connectivity, Magnum inverter/chargers, interconnection system equipment, and accessories are a solid base to build a battery back-up, AC Coupled or off-grid power system. www.magnum-dimensions.com

MidNite Solar, Inc
Booth # 209

MidNite Solar is an innovative manufacturer of electronics and balance of system components for the renewable energy industry. They are the largest manufacturer of combiner boxes in North America and their line of Disconnecting Combiner boxes is another industry first, meeting all of the new NEC requirements for this class of equipment. MidNite Solar products are designed and manufactured in the USA and installed in renewable energy systems around the world. www.midnitesolar.com

Mission Solar Energy
Booth #220

Mission Solar Energy is a manufacturer of solar PV modules well suited for utility, commercial and residential applications. Our modules are assembled in the USA from our 200 megawatt facility in San Antonio, TX.

Morningstar Corporation
Booth # 200

Morningstar Corporation is a world-leading supplier of solar charge controllers & inverters, with over 3 million units installed in over 112 countries. Morningstar's products have been recognized in international solar markets as the most advanced and highest quality products available. Our products exceed all other PV controllers & inverters for protection against extreme environments, corrosion, lightning surges and harsh ambient operating temperatures. www.morningstarcorp.com

NABCEP
Booth # 12

The North American Board of Certified Energy Practitioners (NABCEP) is the most respected, well-established and widely recognized national certification organization for professionals in the field of renewable energy. NABCEP offers entry level knowledge assessment, professional certification, and company accreditation programs to renewable energy professionals throughout North America. NABCEP's mission is to develop and implement quality credentialing and certification programs for practitioners by supporting and working closely with professionals and stakeholders in the renewable energy and energy efficiency industries. Stop by the booth to learn about our partnership with ProSight Specialty Insurance. http://www.nabcep.org

Outback Power Technologies
Booth # 301/302

OutBack Power is the leading designer and manufacturer of advanced power electronics for renewable energy, backup power, marine and mobile applications. Whether the application is village micro-grids in Africa, rural electrification projects in Latin America, remote off-grid cabins in Alaska, or a suburban home in Southern California, OutBack Power has set the bar for delivering high quality, cutting edge power conversion electronics. www.outbackpower.com

Panasonic
Booth #13

You probably know Panasonic as a consumer electronics leader. Did you also know that we've been a solar pioneer since the green revolution began? We started developing promising renewable energy solutions over 40 years ago, and have amassed over 150 solar industry patents to date. It began with the research and development of amorphous silicon solar cells in 1975. In 1997, our innovative solar panel HIT® introduced high-efficiency panels to the world, setting the industry standard for conversion efficiency. Satisfied customers worldwide have come to trust and rely on Panasonic quality ever since.

What makes Panasonic HIT® so good?

- Patented Heterojunction Technology enables higher efficiency
- Up to 36% more electrical output than conventional panels
- Microscopic pyramid structure captures additional sunlight
- Unique water drainage prevents rain water accumulation and eliminates water stains from panel
- World leading temperature characteristics provide improved performance at high temperatures

For more information, visit business.panasonic.com/solarpanels

Pika Energy
Booth # 201

Pika Energy is a U.S.-based manufacturer of innovative power electronics including transformerless islanding inverters and solar power converters. Our technology is designed to make solar installations simpler, more flexible and faster to install. The Pika Energy Island™ uses a single grid-tied inverter to manage solar PV and optional battery storage on a common DC bus. Perfect for backup power and self-supply, the Pika Energy Island is becoming the go-to inverter of many PV installers. www.pika-energy.com

Preformed Line Products/ DPW Solar
Booth # 315

DPW Solar mounting structures are manufactured by Preformed Line Products (PLP) in Albemarle, NC. We are a major manufacturer and supplier of innovative and reliable PV mounting hardware solutions since 1993." The DPW Solar brand name PV solar rack mounting systems are designed for commercial, residential, and utility scale applications. Roof Mount systems include: Power Rail™, POWER XPRESS™, Power-Disk™ rail-less roof mount system, and Ballasted Power Rail™. Ground and Pole Mount Systems include: Power Peak, Multi-Pole Mounts, Large Ground Mounts, Universal Top-of-Pole, Top-of-Pole and Side-of-Pole Mounts." http://www.dpsolar.com

Exhibitor Listing

PROINSO
Booth # 207

With 10 years of experience, over 2.4GW of projects supplied and offices in 27 countries, PROINSO is a leading global distributor of PV modules, inverters, mounting systems and trackers. The Online Store provides fast and easy shopping experience for solar professionals. Exclusive discounts, products, services (like the Advantage software platform) are available to customers registered for PROINSO's Privilege Program. Stop by to learn more about new product lines available in 2017! www.proinso.net

ProSight Specialty Insurance Solutions
Booth # 11

Based in Morristown, N.J., ProSight Specialty® Insurance Solutions was established to provide unrivaled value to clients that goes beyond industry standards. With a strong focus on creating synergistic partnerships with industry experts, ProSight prides itself on securing customized and differentiated coverages, services, and solutions packaged to meet the specific needs of its clients. The success of its clients remains a top priority and a measure by which ProSight defines success. www.prosightspecialty.com

Quick Mount PV
Booth # 105

Quick Mount PV is the leader in flashed waterproof attachments for rooftop solar installations. Quick Mount PV has solutions for most roofing types and is committed to producing the industry's most advanced solar mounting systems with industry-leading R&D, engineering, product testing and ISO 9001:2008 certified manufacturing in California. http://www.quickmountpv.com/index.html

RBI Solar, Inc.
Booth # 305

RBI Solar, Inc. designs, engineers, manufactures and installs solar mounting systems for large commercial and utility scale projects. As a specialist in ground mount, roof mount, and custom designed specialty solar structures, RBI focuses on providing best-in-class racking systems and project management capabilities to serve owners and integrators. RBI Solar offers a broad range of solar racking systems to support every PV module manufacturer. http://www.rbisolar.com/

Rolls Battery Engineering
Booth # 217

Located in Springhill, Nova Scotia, Surrette Battery Company produces a wide range of Rolls-branded premium deep cycle batteries for use in off-grid, grid-tied and standby Renewable Energy applications. Rolls 4000, 4500 & 5000 Series flooded models as well as the popular maintenance-free sealed AGM & GEL ranges are internationally recognized for their dependability, outstanding quality and industry-leading manufacturer warranties. http://www.rollsbattery.com

Roof Tech Inc
Booth # 202

Roof Tech is a subsidiary of Yanegiken, a Japanese company founded in 1968 to research and develop roofing technologies. Utilizing a unique flashing method that adheres PV module mounts to asphalt roofing systems, Roof Tech has completed the rigorous process to obtain the ICC-ESR 3575, being to date, the only PV Mounting system with a third party evaluation report for its flashing system. RT E Mount, Roof Tech's signature rail-less PV mounting system comes integrated with RT Butyl. www.roof-tech.us

S-5!
Booth # 312/313

S-5!® is the world's leading manufacturer of attachment solutions for metal roofing. S-5! now offers exposed-fastened metal paneling attachment solutions and is the premier solution provider for the attachment of solar panels with the newly redesigned S-5-PV Kit, which fits the majority of panels and roofs on the market and costs as little as $0.06 per watt! www.s-5.com

Schneider Electric
Booth# 212

Inverter/electrical BOS manufacturers

SnapNrack Solar Mounting Solutions
Booth # 208

SnapNrack, owned by Sunrun, is a leading manufacturer of innovative solar mounting solutions designed to reduce installation costs, improve installation quality and safety, and make the job of solar installers easier. SnapNrack roof and ground mount systems feature a single tool installation, pre-assembled snap-in hardware, integrated wire management, integrated grounding/bonding and Class A Fire Rating in accordance with UL2703/UL1703 standards. www.SnapNrack.com

SolarEdge Technologies
Booth # 318

SolarEdge Technologies, global leader in the DC power optimizer market, provides module-level electronics for solar power harvesting and monitoring systems for residential, commercial and utility-scale solar photovoltaic installations.

Solar Energy International
Booth # 307

For 25 years, Solar Energy International has been dedicated to hands-on labs, online solar photovoltaic training, and renewable energy education. With the mission to provide industry-leading technical training and expertise in renewable energy, SEI's programs empower people, communities, and businesses worldwide. Named 2015 Accredited Clean Energy Training Provider, SEI is the leader in renewable energy education. Visit www.solarenergy.org

SolarRoofHook
Booth # 310

SolarRoofHook.com has a wide range of innovative products for mounting solar panels onto residential roofs. We offer solutions for Asphalt Shingle, Flat and Spanish Tile, and Stone Coated Steel roofs. Our factories can produce custom products from start to finish in 60 days and are continually working with installers to deliver the best products needed for any type of roof. Products are stocked in Livermore, CA and Rock Hill, SC. SolarRoofHook.com is a division of Quickscrews International Corp. www.solarroofhook.com

Solar-Log
Booth # 102

Solar-Log is a global market leader in web-enabled monitoring for PV plants. Solar-Log is monitoring over 240,000 plants world-wide, through nearly 1 million connected inverters, with generating power totaling over 10 GW. Solar-Log monitors plant performance, provides real-time error detection and status information, and offers revenue-grade metering. This industry-leading functionality maximizes plant performance, optimizes self-consumption, provides grid feed-in controls and fleet management. http://www.solar-log-america.com/

Solar Reviews
Booth # 316

Solar Reviews came about because we found a gap between what consumers in the solar industry wanted and what was available. The ability to view reviews on an Installer and to directly contact them was limited, often forcing consumers to choose "3-quotes" sites. Add to this the fact that the consumer did not know the companies and you often had an unhappy experience for both installers and consumers. Solar Reviews is trying to both inform consumers as to installer performance, and to promote valid installers to consumers. www.solarreviews.com

Sollega Inc.
Booth # 205

Sollega Inc. is a leading solar PV raking manufacturer specializing in ballasted commercial flat-roof and ground mount racking solutions since 2009. Our mission is to provide the easiest to install and most cost effective solar PV mounting solutions available. Our goal is to enable the installation of solar PV on every suitable flat surface in the world. www.sollega.com

sonnen, Inc.
Booth # 206

Sonnen is the pioneer of smart energy storage systems having installed 10,000 storage solutions globally. Coupled with a solar-energy system, the sonnenBatterie eco systems supply homeowners with up to 100 percent of their energy, provide backup power and take advantage of different tariff structures for off-peak vs. on-peak use. For commercial customers, sonnenBatterie pro helps reduce demand spikes and allows businesses to participate in utility demand response programs throughout the U.S. http://www.sonnen-batterie.com

Exhibitor Listing

Spice Solar
Booth # 101

Spice Solar with Built-In Racking™ is a complete system that reduces parts, labor and engineering cost on every job. With 35 years of solar experience, Spice Solar is the leading rooftop installation technology to quickly connect and ground modules for all orientations and roof types, while maintaining module warranty integrity. Spice Solar modules and components deliver unprecedented strength over rack-less systems, for certified reliability in even the most extreme wind and snow load conditions. www.spicesolar.com

SunModo Corp
Booth # 210

SunModo, meaning "the way of the sun," is a private U.S. company based in Vancouver, Washington focusing on innovative racking and mounting solutions for professional installers in the fast-growing solar industry. We are energized every day by a desire to make solar installation easier, more reliable and more affordable. Our commitment to innovation can be seen across our entire product line, which included 14 industry-shaping patents. www.sunmodo.com

The PowerStore
Booth # 308

The PowerStore Inc (TPS) supply power solutions into many different market sectors; Off-Grid, Renewable – Solar & Wind, Telecom, Marine, Industrial, Automotive, Supply Chain, Military and many more. As well as our range of power solutions we also stock many other complementary products to provide a one stop shop for our customers.

Trojan Battery Company
Booth # 306

Trojan Battery is the world's leading manufacturer of deep-cycle batteries, with a complete portfolio of advanced deep-cycle flooded, AGM and gel batteries offering maximum long-lasting performance to meet the requirements of today's advancing renewable energy systems. To address the impact of Partial State of Charge in renewable energy applications, Trojan Battery features Smart Carbon™ in its Industrial and Premium batteries, offering increased life, improved charging and recharging. www.trojanbattery.com

UMA Solar
Booth #7

UMA Solar is the leading solar thermal and solar electric manufacturer and distributor. For more than 38 years, we have been working with local dealers in providing solutions and energy savings for residential and commercial customers. We provide high quality products as well as full technical and marketing support to our dealer network across the US, Canada, and Caribbean Islands.

Unirac, Inc.
Booth # 103

EXPERIENCE THAT MAKES A DIFFERENCE. UNIRAC is the leading manufacturer of PV mounting systems in North America. We provide the best mounting solutions to our customers through high quality, competitively priced products, responsive customer support, industry leading engineering services and excellence in supply-chain management.

- Unmatched Experience
- Progressive Products
- Certified Quality
- Engineering Excellence
- Bankable Warranty
- Design Tools
- Permit Documentation

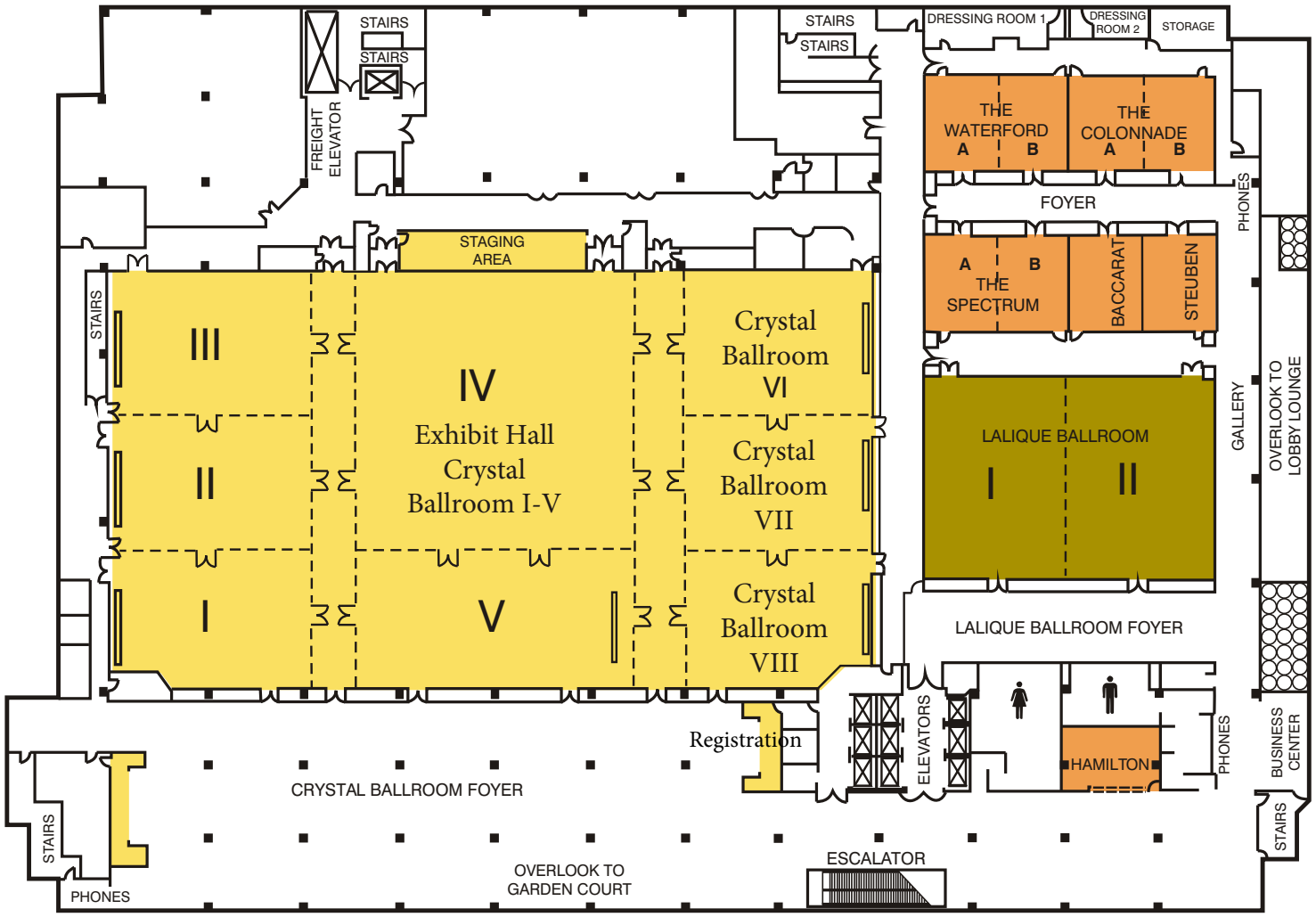
http://unirac.com

Yaskawa – Solectria Solar
Booth # 303

Yaskawa – Solectria Solar, a wholly-owned subsidiary of Yaskawa America, Inc., is the largest commercial inverter manufacturer in the U.S. Solectria's products include 3.8 to 750 kW inverters, string combiners and web-based monitoring for all size solar systems. Solectria is backed by over 100 years of power electronics and inverter experience. All of Solectria's three-phase central inverters are made in the USA. www.solectria.com

Meeting Rooms

Hotel InterContinental Dallas
BALLROOM LEVEL



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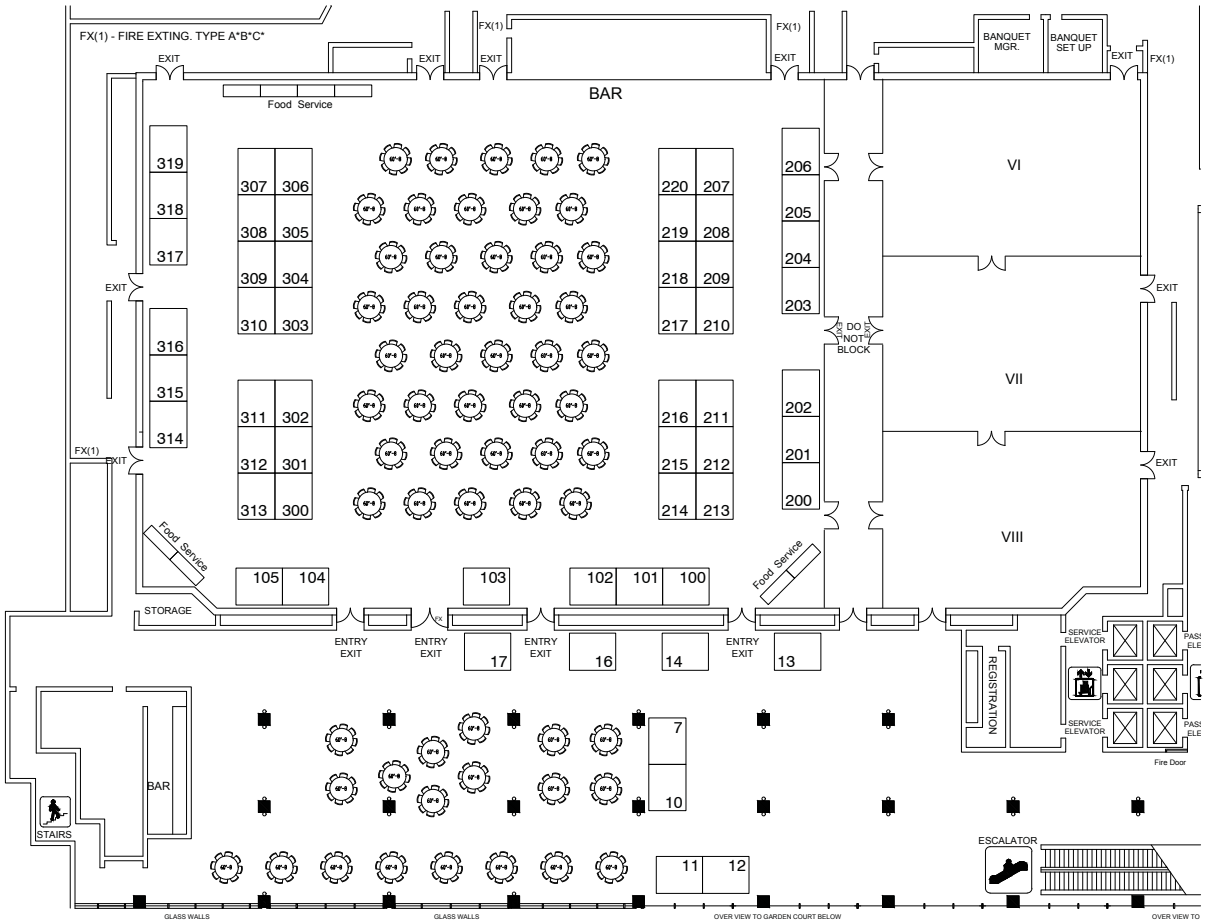
North American Board of Certified Energy Practitioners

MARCH 20-23, 2017

CRYSTAL BALLROOM 1-5 - INTERCONTINENTAL HOTEL DALLAS - ADDISON, TEXAS



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TUESDAY, MARCH 21, 2017

Design and Install with CertainTeed Solar Presented by CertainTeed Solar

Tuesday, March 21, 2017
8:00am-9:30am
Baccarat
1.5 CEU Credits

CertainTeed Solar offers a variety of solar products, including rack-mounted and Building Integrated PV. In this training, we will discuss all of our offerings, with emphasis on the Apollo II solar shingle. The Apollo II series includes slim, low profile solar shingles and tiles designed to aesthetically integrate into their asphalt shingle or concrete tile roofs. While the Apollo II modules function as solar modules, they also function as the roof itself. This session will explore their dual functions and highlight key differences in designing and installing these types of systems as opposed to more traditional rack mounted systems. The session will conclude with a hands-on installation of the Apollo II solar shingle.

Microinverters in the Residential Environment—APsystems YC500 Dual Module Solution Presented by APsystems

Tuesday, March 21, 2017
8:00am-9:30am
Lalique Ballroom I
1.5 CEU Credits

This session will examine the advantages of implementing microinverters in single phase residential applications. We will also highlight the techniques for designing for communication and how to minimize return site visits while maximizing operation profits demonstrated through the installation of the APsystems microinverters.

Schneider Conext for Lithium Ion and Advanced Battery Solutions Presented by Schneider Electric

Tuesday, March 21, 2017
8:00am-9:30am
Lalique Ballroom II
1.5 CEU Credits

A stable source of DC is the "heart" of the Conext XW+/SW platform. Whether designing for export, self-consumption or off-grid, it is important to have enough stored energy to prioritize battery power and/or last through non-solar hours. In this training session we will explore different battery chemistries with a focus on Advanced Batteries such as Li-Ion, their advantages, and how the Conext line of products allow for proper charging and care of those battery types.

Design Considerations for PV Racking on Commercial Flat Roofs Presented by Unirac, Inc.

Tuesday, March 21, 2017
8:00am-9:30am
The Colonnade A
1.5 CEU Credits

PV racking for commercial flat roofs has changed dramatically in the last few years, and a south-facing-array-tilted-at-latitude is no longer always the best choice. This class assumes PV design knowledge, such as the effects of azimuth and shadow spacing, and experience making economic decisions for commercial PV arrays. We examine the pros and cons of low tilt and dual (east/west) tilt, and discuss how to tailor the best solution for your custom array. We don't supply the answers, but we clarify the questions.

Battery 101: Flooded vs. AGM vs. GEL Presented by Trojan Battery Company

Tuesday, March 21, 2017
8:00am-9:30am
The Colonnade B
1.5 CEU Credits

Trojan Battery discusses key battery differences and its U.S.-based manufacturing process. Learn about battery selection, charging guidelines, system sizing and proper maintenance. You'll also gain an understanding of battery capacity ratings, cycle life expectations and how field conditions affect battery life and performance. In addition, you'll learn about Smart Carbon™, Trojan's proprietary formula which provides improved performance when the batteries operate in Partial State of Charge.

Making Solar More Accessible Through Innovation Presented by SolarRoofHook

Tuesday, March 21, 2017
8:00am-9:30am
The Spectrum A
1.5 CEU Credits

Join us as SolarRoofHook shares its insights into reducing costs of solar installation with the QuickBOLT™ and innovative Roof Hooks, derived from 30 years of experience in the woodworking industry Attend this training to learn:

- Why SolarRoofHook believes innovation is the key to making installation easier
- How innovative screw designs make solar installation easier
- What innovations have been made in order to make the 100% waterproof QuickBOLT™, for installations on Asphalt Shingle

Photovoltaic Performance Monitoring with Solar-Log Presented by Solar-Log

Tuesday, March 21, 2017
8:00am-9:30am
The Spectrum B
1.5 CEU Credits

Solar-Log®, by Solar Data Systems, Inc., discusses Solar-Log® smart energy monitoring solutions including smart bidirectional meters, the use of onsite weather stations and satellite weather data to benchmark yield against local irradiance, geographic plant clustering, and reliable REC reporting. We will discuss accurate energy consumption monitoring and why this is a valuable piece of the home energy equation, which is greatly overlooked. Attendees will understand the value of third party monitoring and power management applications. Attendees will:

- Be able to explain the difference between traditional PV Monitoring systems, often inverter integrated, and smart monitoring systems and understand the important role smart meters play.
- Be able to explain how installers can maximize homeowners' self-consumption and select the correct self-consumption monitoring solution per PV plant.
- Understand how to integrate onsite weather stations and satellite weather data to ensure optimal PV plant
- Create a PV Plant portal on the Solar-Log WEB and navigate the various reporting tools.
- Understand how to use the PV fleet management tools and data analysis offered in the Solar-Log WEB portal.

DC and AC Coupled Solar Storage Solutions Presented by Magnum Energy

Tuesday, March 21, 2017
8:00am-9:30am
The Waterford A
1.5 CEU Credits

This session will provide a detailed understanding of Magnum Energy products used in DC coupled solar based applications and our new grid tied AC coupled storage ready product solution. The presentation will include specifics on the PT-100 MPPT medium voltage 100 Amp charge controller, as well as a brief overview of our interconnection system equipment and remote controls. The discussion will also focus on technical details and installation of our recently released MicroGT-500 dual MPPT grid-tied storage ready micro-inverter.

Installing the Pika Energy Island for Simplified Grid-Tied Solar with Optional Battery Storage Presented by Pika Energy

Tuesday, March 21, 2017
8:00am-9:30am
The Waterford B
1.5 CEU Credits

This session provides training on selling, installing and commissioning the U.S.-made Pika Energy Island for grid-tied solar with optional battery integration. We'll give an overview of the system, compatible battery options, detailed installation instructions, and will field your questions

Data Acquisition, Energy Monitoring and Fleet Management Platforms

Sponsored by: MORNINGSTAR

Moderator: Andrew Truitt, Dividend Solar
INVITED PANEL
Gabe Abbott - Locus Energy
Shavaj Kallamkote - CarbonTRACK
Erik Norwood - Curb
Alison Hyde-Adams - Also Energy
Jake Whiteley - RadianGen
Brad Berwald - Morningstar

Tuesday, March 21, 2017
10:00am-12:00pm
Lalique Ballroom II
2.0 CEU Credits

Monitoring has become a critical element for the majority of PV system installations. Different platforms offer varying value propositions to varying user groups—from system owners to installers, fleet managers to financiers. This panel will explore the details of some leading and emerging providers with respect to what can be monitored (e.g. PV, whole-home demand, circuit-level consumption), troubleshooting, performance analysis, installation processes, and communications architectures.

Major Updates in PV Codes and Standards

Sponsored by: Rolls BATTERY ENGINEERING

Moderator: Rebekah Hren, Solar Energy International
INVITED PANEL
Steve Higgins - Rolls
Jason Fisher - Solar City
Bill Brooks - Brooks Engineering
Ryan Mayfield - Renewable Energy Associates

Tuesday, March 21, 2017
10:00am-12:00pm
Crystal Ballroom VI
2.0 CEU Credits

A broad but specific overview of important major updates to PV codes and standards. We will focus on NEC Articles 690 and 705, plus four brand new articles in the 2017 NEC including 1) Energy Storage, 2) Stand-alone Systems, 3) DC Microgrids and 4) Large Scale PV Electric Power Production Facilities. Our panelists will also address the reduced fire setbacks and pathways in building and fire code, and review developing standards for energy storage systems including the new subject standard UL 9540.

Case Studies – Energy Storage and Rule 21 Advanced Inverter Functions

Moderator: Brian Lydic, Fronius USA
INVITED PANEL
Greg Smith - Sonnen
Emily Hwang - Solectria
Blair Reynolds - Enphase
Jason Bobruk - SolarEdge

Tuesday, March 21, 2017
10:00am-12:00pm
Crystal Ballroom VII
2.0 CEU Credits

Advanced inverter functions and energy storage are the new industry buzzwords, but you may be asking, what's all this fuss about? California's Rule 21 and Hawaii's Rule 14H are actively shaping integrated grid support capabilities in inverters and energy storage systems. New functionality from advanced inverters and storage for residential to commercial/industrial is available today and will be required or desired in California and Hawaii this year, with many other states coming over the next several years. Hear from experts with case studies of current and new applications utilizing storage and/or grid support capabilities. We will explore new use cases and opportunities for pioneering companies and with creative products and applications.

Selling More Solar— the Role of Financing

Sponsored by: MITSUBISHI ELECTRIC SOLAR INNOVATIONS

Moderator: Geoff Greenfield, Third Sun Solar
INVITED PANEL
Chris Doyle - Dividend Solar
Jake Hoppe - Spruce Finance
G.P. Caminiti - Mitsubishi

Tuesday, March 21, 2017
10:00am-12:00pm
Crystal Ballroom VIII
2.0 CEU Credits

One of the biggest factors in successfully closing the sale for residential and commercial PV systems is providing the right financing option. In this panel we will investigate the latest developments in solar leases, loans, and other innovative financing options for residential and commercial solar, and explore their impact on payback/ROI, the sales process, and the customer experience.

Solar Mounting, Codes and Best Practices Presented by Quick Mount PV

Tuesday, March 21, 2017
1:30pm-3:00pm
Baccarat
1.5 CEU Credits

Worried about roof leaks? Protect your solar investment, and attend Quick Mount PV's presentation to find out how our 100% code-compliant, waterproof solar roof mounts can help you install solar faster without compromising quality. Quick Mount has installed over 8 million mounts over the last ten years, with zero leaks. Co-presented by Jeff Spies, Senior Director of Policy, and Johan Alfsen, Director of Training, we will provide an executive overview of our mounting solutions for comp and tile roofs tailored to experienced installers and business executives regarding Solar Roofing Best Practices, Roofing Codes for Solar, and Quick Rack Rail-Free Design and Installation. Put your company on a path to Zero Leaks with our time-tested technology - your best insurance against roof leaks.

Designing and Installing Enphase IQ Microinverter Systems Presented by Enphase Energy

Tuesday, March 21, 2017
1:30pm-3:00pm
Lalique Ballroom I
1.5 CEU Credits

The new, 6th generation Enphase Microinverter System with IQ provides greater onsite flexibility and dramatically improves installation time. Built for higher-powered 60- and 72-cell modules, the IQ 6 and IQ 6+ are smart-grid ready and are rapid shutdown compliant – without additional hardware. This training session is targeted towards PV and Storage system designers and installers to develop core knowledge related to the installation and commissioning of the Enphase IQ system.
Join us for this technical training to learn:

- The new components of the Enphase IQ system and how they fit together
- Why the IQ systems doesn't require a ground or a neutral (and how to address related plan check or inspector questions)
- Best practice microinverter installation and cable management for Enphase IQ

Energy Storage - Battery Bank Sizing, Care and Troubleshooting Presented by Rolls Battery Engineering

Tuesday, March 21, 2017
1:30pm-3:00pm
Lalique Ballroom II
1.5 CEU Credits

Proper selection and sizing of battery banks for off-grid and grid-connected systems will be discussed, as well as inspection and installation, system setup, programming of charging set points, as well as ongoing battery maintenance and care to retain capacity and ensure long cycle life. Identifying charging issues, causes of capacity loss and other troubleshooting techniques will also be covered.

Rapid Shutdown Systems (RSS) for Residential Solar PV Installations Presented by PROINSO

Tuesday, March 21, 2017
1:30pm-3:00pm
The Colonnade A
1.5 CEU Credits

Come get some clarity on Rapid Shutdown Systems. This training session will cover:

- Understanding the electrical hazards related to PV solar rooftops and why rapid shutdown is used?
- Rapid shutdown requirements in the National Electric Code: RSS development between 2014 & 2017 Codes
- NEC application by state: When will RSS regulation affect me?
- OMRON option to comply rapid shutdown requirements

Complying with Arc Fault and Rapid Shutdown Requirements Presented by Yaskawa—Solectria Solar

Tuesday, March 21, 2017
1:30pm-3:00pm
The Colonnade B
1.5 CEU Credits

Yaskawa - Solectria Solar will explore the primary considerations of achieving compliance with NEC 2014 & 2017 for arc fault detection and rapid shutdown requirements. Information in this training is also valuable for those having to comply with NEC 2011 arc fault detection requirements.
Topics discussed will include:

- Achieving AFDI and rapid shut down compliance for central inverters using string combiners
- Achieving AFDI and rapid shut down compliance for three-phase string inverters
- Arc fault detection technology basics

Rapid Shutdown 2.0: What You Need to Know for 2017 and Beyond Presented by OutBack Power Technologies

Tuesday, March 21, 2017
1:30pm-3:00pm
The Spectrum A
1.5 CEU Credits

The impact of NEC 2014 and 2017 requirements are now being felt throughout the solar industry—there's a lot of information and no small amount of confusion surrounding this vital topic. As the one brand with a comprehensive, fully-compliant solution for battery-based systems listed to UL1741-PVRSS for PV Rapid Shutdown, OutBack Power will provide insight and guidance covering what you need to know to confidently design and install with rapid shutdown requirements in mind. This session includes:

- 2014 and 2017 code requirements, and their impact through 2019
- Review of compliant combiner and rapid shutdown technologies and solutions, including OutBack's ICS Plus

Advanced Ground Mount and Pitched Roof Presented by IronRidge, Inc.

Tuesday, March 21, 2017
1:30pm-3:00pm
The Spectrum B
1.5 CEU Credits

Advanced Ground Mount
As you know, no two Ground Mount Systems installations are the same. In this presentation, we explore the wide array of site conditions installers encounter and review best practices around topics like: dealing with ground water, building on sloped land, and planning for cold climates. In addition, we'll share a field-tested and proven method of saving time on large-scale installations. We'll also show you how to use the new visual interface in Ground-based Design Assistant to plan your project and generate a bill of materials.

Advanced Pitched Roof
IronRidge Training Manager Dan Felix draws from over 20 years of experience as a solar installer to share his tips and tricks for residential installations. Topics covered include: attachment best practices for different roof types, how to splice rails and square modules, and how to design a residential solar project in Pitched Roof Design Assistant.

Master Class in Knees (the IV curve kind of course) Presented by Interplay Learning

Tuesday, March 21, 2017
1:30pm-3:00pm
The Waterford A
1.5 CEU Credits

In this fast paced and 3D simulation-supported presentation, Mark will cover everything he can about the most fundamental concept to our entire business – the IV curve. You will learn about the 'equivalent circuit of a solar cell', and how cell physics actually makes that 'knee' shaped graph; why you lose voltage with heat (it's not resistance); how shading distorts it into the 'dolphin nose', and why string inverters don't 'shut down' when one module is shaded; how max power tracking works, and what the heck an 'inverter IV curve' is. When you leave the course, you will leave not only smarter but also will be prepared to talk directly with panel manufacturers regarding their technical claims. No equations, just knee knocking fun.

Techniques for Discovering Useful Information from Energy Meter Data Presented by eGauge Systems, LLC

Tuesday, March 21, 2017
1:30pm-3:00pm
The Waterford B
1.5 CEU Credits

Take a walk with the eGauge technical team through the complexities of installing an energy meter, collecting mass amounts of data from a solar PV system, and digesting that data into practical information. This course will cover everything from reducing meter installation time to analyzing energy data and understanding the abnormalities in a PV array that impact ROI.

Future Business Structures for PV Installation Companies

Sponsored by: BayWa r.e. renewable energy

Moderator: Barry Cinnamon, Spice Solar
INVITED PANEL
Jeff Wolfe - GroSolar
Pamela Cargill - Chaolysti
Gary Gerber - Sunlight and Power

Tuesday, March 21, 2017
3:30pm-5:30pm
Lalique Ballroom II
2.0 CEU Credits

At $10/watt installers were artistes. At $5/watt installers became finance experts. Now, with residential solar selling as low as $2.50/watt, how can solar contractors continue to run a solar business and maintain profitability? Several big installers have exited the market due to profit pressures, while many local installers still enjoy profitability by staying below the radar. Lower installation prices may be a win for customers, but are fundamentally changing the landscape of the business from financing to customer acquisition processes, product distribution strategies, piecework operations, cash flow management, and even organization structure. This panel of solar experts will present their views on successful business structures for the PV installer of the near future…analyzing strategies on market scope (national vs. regional and local), sales vs. installation only, franchising, or maybe something we haven't even seen yet. Our panel will relate how these trends impact tasks performed by NABCEP certified installation and sales professionals and how these solar pros can help structure their business and operations to maintain profitability without sacrificing system quality.

Rapid Shutdown Requirements and Solutions

Sponsored by: solaredge

Moderator: Ward Bower, ABB
INVITED PANEL
Bill Brooks - Brooks Engineering
Jason Fisher - SolarCity
Isaac Opalinsky - SunPower
Jeff Spies - Quick Mount PV
Jason Bobruk - Solar Edge

Tuesday, March 21, 2017
3:30pm-5:30pm
The Crystal Ballroom VI
2.0 CEU Credits

This panel will address 2014 and 2017 NEC Rapid Shutdown requirements and explore how installers, manufacturers, test labs, jurisdictions, and code officials interpret this rapidly evolving topic. We will discuss installation considerations for a wide range of PV system installations from large to small We will also explore how the new UL 1741 testing will impact this rapidly evolving topic.

Energy Storage— Learning a New Language

Sponsored by: ENPHASE.

Moderator: Ezra Auerbach, DSC Consulting
INVITED PANEL
Tristan Kreager - Kreager Solar Associates
Steve Higgins - Rolls Battery Engineering
Greg Smith - Sonnen Inc
Terry Holtz - Aquion
Blair Reynolds - Enphase
Neal Roche - Aquion

Tuesday, March 21, 2017
3:30pm-5:30pm
Crystal Ballroom VII
2.0 CEU Credits

The changing vocabulary of energy storage reflects the broadening range of choices afforded to a ESS designer. This panel will explore the types of energy storage systems available and establish a clear understanding of the language and terminology needed to help system designers communicate effectively with customers and properly manage expectations for the ever widening range of choices.

Improving system ROI through Best Practices in Solar PV System Design, Installation, Monitoring, and O&M

Sponsored by: APsystems ALTENERGY POWER

Moderator: Rudy Saporite, IBTS
INVITED PANEL
Chris Barrett - AP Systems
Rebekah Hren - Solar Energy International
Brian Mehalic - Solar Energy International
Jeff Gilbert - Azimuth Solar Training
Doug Soester - Dividend Solar

Tuesday, March 21, 2017
3:30pm-5:30pm
Crystal Ballroom VIII
2.0 CEU Credits

Understanding best practices in system design, installation, monitoring, and O&M of PV systems is critical to reduce common deficiencies and overall cost of operation. Learn about lifecycle costs of design and installation mistakes and understand the impact these variables play on system kWh performance and ROI. Attendees will learn to identify problems using remote methods that reduce costly truck rolls, and understand the best strategies to remedy issues and bring the system back on line with optimal performance. Understanding these principles will improve O&M planning, reduce down time, and improve system performance and ultimately maximize ROI.

Pioneers of PV—the Documentary Presented by Quick Mount PV

Tuesday, March 21, 2017
8:30pm-9:30pm
Lalique I

Modern PV technology was introduced by Bell Labs in the 50's but it wasn't until the early 80's that the PV industry was born. Learn about the early backwoods engineers and business hippies that took this magical technology and turned it into an industry. Documentary filmmaker Jeff Spies will tell the story of the Solar Pioneers and screen a teaser clip of his upcoming documentary film debuting in November at the Third and Final Solar Pioneer Party in Mendocino County.

WEDNESDAY, MARCH 22, 2017

Many Ways to Proof the Roof and Stand and Land with SunModo Racking Presented by SunModo Corp.

Wednesday March 22, 2017
8:00am-9:30am
Baccarat
1.5 CEU Credits

In this training workshop, participants will be introduced to SunModo, the three types of PV systems and the SunModo products that address these applications. Pitch roof solar mounting on shingle, metal, tile roofs, and standing seam roofs, large Flat Roof PV systems with minimal penetrations, and Ground Mount systems will be discussed in detail. Concrete and post, auger mounting and ballasted mounted ground systems will be discussed. Design, wind loading, tilt and shading, and structural considerations will be covered.

Optimize Your PV Business with SolarEdge Presented by SolarEdge Technologies

Wednesday March 22, 2017
8:00am-9:30am
The Lalique Ballroom I
1.5 CEU Credits

Learn how SolarEdge's optimized inverter solution is designed to achieve more energy, increase design flexibility, provide module-level production data and create a safer more reliable PV system.

Get Off the Roof Faster! Lean Installation Practices Presented by Unirac, Inc.

Wednesday March 22, 2017
8:00am-9:30am
The Lalique Ballroom II
1.5 CEU Credits

Learn simple strategies to cut your crew's time on the roof. Installation factors including division of labor, racking style, hardware, tools and warehouse preassembly all help save time and money. Increase your expertise through tips and tricks to improve project preparedness and installation proficiency.

Intelligent Energy Storage—An Overview of Batteries, Applications and Installation Presented by sonnen, Inc.

Wednesday March 22, 2017
8:00am-9:30am
The Colonnade Room A
1.5 CEU Credits

The session would include a review of the key elements required to properly size an install a residential energy storage system to work with onsite PV to provide backup power, time-of-use and increased solar self-consumption. Includes a review of various battery technologies and the sizing tool that sonnen has developed for calculating backup power needs.

Remote Monitoring of Your Off-Grid Power Systems Presented by Morningstar Corporation

Wednesday March 22, 2017
8:00am-9:30am
The Colonnade Room B
1.5 CEU Credits

This course will provide an overview of the latest data enabled Solar Charge Controllers in our product line and provide detailed setup and configuration of their remote monitoring capabilities. These include detailed system monitoring, data logging, remote access, email and notifications of critical system alerts. We will also be demonstrating our new centrally managed web application for powerful and scalable monitoring of hundreds of controllers.

Aqueous Hybrid Ion (AHI) Battery Product Training Seminar Presented by Aquion Energy

Wednesday March 22, 2017
8:00am-9:30am
The Spectrum A
1.5 CEU Credits

Aquion Energy, developer and manufacturer of Aqueous Hybrid Ion (AHI™) batteries, the world's only Cradle to Cradle Certified™ batteries, will provide an introduction to AHI chemistry, product design, and performance insights gained from its 200+ deployments. Attendees will gain knowledge about the benefits of AHI versus other energy storage chemistries, as well as guidance on installation, use, and safety of AHI batteries.

Wiley-Solar Solutions for Grounding, Bonding and Wire Management Presented by Burndy, LLC

Wednesday March 22, 2017
8:00am-9:30am
The Spectrum B
1.5 CEU Credits

A deep dive, technical discussion and interactive experience with proper installation of Burndy/Wiley product for compliance with NEC & Listing requirements. Project applications from residential to utility scale will be covered with best practices and where to install Burndy/Wiley products. Product samples are handed out and various racking/module frame assemblies are passed around for an up-close inspection and better understanding. In addition, wire management will be covered since inspectors are clamping down on using better methods for these long term applications.

The Perfect Combination: RoofTop Solar and Metal Roofing Presented by S-5!

Wednesday March 22, 2017
8:00am-9:30am
The Waterford A
1.5 CEU Credits

During this course you will learn the actual value of solar on a metal roof, how easy it is to install on a metal roof, the cost associated with the installation, proper installation techniques and the best practices.

Designing and Installing Enphase Energy Storage Systems Presented by Enphase Energy

Wednesday March 22, 2017
8:00am-9:30am
Waterford B
1.5 CEU Credits

The new, 6th generation Enphase Microinverter System with IQ provides greater onsite flexibility and dramatically improves installation time. Built for higher-powered 60- and 72-cell modules, the IQ 6 and IQ 6+ are smart-grid ready and are rapid shutdown compliant – without additional hardware. This training session is targeted towards PV and Storage system designers and installers to develop core knowledge related to the installation and commissioning of the Enphase IQ system.
Join us for this technical training to learn:

- The new components of the Enphase IQ system and how they fit together
- Why the IQ systems doesn't require a ground or a neutral (and how to address related plan check or inspector questions)
- Best practice microinverter installation and cable management for Enphase IQ

Residential Roof Racking Systems—Rail vs Rail-less and BIPV

Sponsored by: SnapNrack Solar Mounting Solutions

Moderator: Roger Williams, Solar Energy International
INVITED PANEL
Katy Collardson - Certainteed
Barry Cinnamon - Spice Solar
Johan Alfsen - Quickmount PV
Edgar Becerra - Mitsubishi
Greg McPheeters - SnapNrack

Wednesday March 22, 2017
10:00am-12:00pm
Lalique Ballroom II
2.0 CEU Credits

Join us for a lively discussion regarding the future of roof-mounted PV. How will rail-based mounting techniques continue to evolve, or will rail-less systems become the norm? Will BIPV 'solar shingles' finally break into the US residential market? How can rail-based systems improve? What are the challenges to adoption

of rail-less, or BIPV, systems? The panelists have over 70 years of combined hands-on experience with rail-based and rail-less mounting systems. Learn from their wisdom gained from decades of experience as we look into the multi-crystalline ball to see the future of roof-mounted PV.

UL 2703 – PV System Bonding/ Grounding and Fire Classification

Sponsored by: APsystems

Moderator: Jeff Spies, Quick Mount PV
INVITED PANEL
James Cormican - RBI
Dustin Haddock - S-5
Klaus Nicolaedis - Unirac

Wednesday March 22, 2017
10:00am-12:00pm
Crystal Ballroom VI
2.0 CEU Credits

UL 2703 is now the official standard for PV bonding and grounding and fire classification. Learn how installation practices can assure compliance with UL 2703 grounding and bonding integrity and common errors that compromise compliance with building and fire code requirements.

Connecting business strategy to NABCEP Key Job Tasks

Sponsored by: BayWa r.e. renewable energy

Moderator: Boaz Soifer, BayWa r.e.Solar Systems, LLC
INVITED PANEL
Mike Teresso - Baker Electric Solar
Gary Gerber - Sunlight and Power
Chad Waits - Net Zero Solar
August Goers - Luminalt Solar

Wednesday March 22, 2017
10:00am-12:00pm
Crystal Ballroom VII
2.0 CEU Credits

Business managers can create strategy and policies to support, or hinder the ability of their NABCEP-certified employees to deliver outcomes such as setting clear customer expectations, or differentiating emerging technology from current technology. This panel will examine what the executive teams of small and large solar installation companies have done to align their organizations around quality.

Community Solar Industry Overview and Insights

Sponsored by: MISSION SOLAR ENERGY

Moderator: Andrew Truit, Dividend Solar
INVITED PANEL
Beth Copanas - GRID Alternatives
Dan McIlroy - Clean Energy Collective
Walter Sharp - Sharper Energy Technologies
Julia Sullivan - Stion
Odette Mucha - DOE/SunShot
Trevor Udwin - Mission Solar Energy

Wednesday March 22, 2017
10:00am-12:00pm
Crystal Ballroom VIII
2.0 CEU Credits

Community Solar is now one of the fastest growing sectors of the PV industry. It is estimated that only about ½ of existing US residential roofs are appropriate for PV, which leaves a large addressable market for off-site arrangements like Community Solar (aka Shared Solar or Solar Gardens). This panel will provide an overview of the current status of the market along with thoughts on how the sector will evolve in 2017 and beyond.

MidNite Solar's Rapid Shutdown System Presented by MidNite Solar

Wednesday March 22, 2017
1:30pm-3:00pm
Baccarat
1.5 CEU Credits

This session will provide participants with a working knowledge of MidNite Solar's Rapid Shutdown system and how it satisfies the requirements of NEC Article 690.12
Topics to be covered include:

- The fundamentals of NEC Article 690.12 in both the 2014 and 2017 code revisions
- A discussion of Midnite's existing and upcoming product line to satisfy NEC requirements
- A look at Rapid Shutdown from a firefighter's perspective
- Shutdown and wiring considerations unique to various system configurations, such as battery and non-battery based grid-tie and stand alone systems, and isolated and non-isolated inverters
- Overview of how to specify and install Midnite Solar's Rapid Shutdown system components
- Wiring diagrams for various system configurations
- Verifying proper system function of the Midnite Rapid System Shutdown System

Commercial Three Phase Microinverter Solutions—Includes Design for Communication Presented by Apsystems

Wednesday March 22, 2017
1:30pm-3:00pm
Lalique Ballroom I
1.5 CEU Credits

This session will highlight the advantages of the Three Phase Microinverter installed within commercial markets. We will review performance, versatility and operational advantages of installing native three phase microinverters. This session will also discuss designing microinverter systems for enhanced communication and monitoring freedom.

Solar Array Design for Commercial Buildings Presented by ISA Corp.

Wednesday March 22, 2017
1:30pm-3:00pm
Lalique Ballroom II
1.5 CEU Credits

This course provides tools to evaluate commercial buildings for solar capacity - based on its size, roof geometry, shadowing effects, and structure. It includes procedures for estimating and calculating the amount of solar that can be installed on space challenged and how to handle solar arrays adjacent to roof mounted equipment. Comparisons are made of solar capacity and efficiency vs. array height and tilt. Alternatives for maximizing solar capacity on roofs are presented along with their relative costs.

Procedures are presented for obtaining roof data from drawings and onsite inspections combined with layout of racking equipment to provide the information needed for structural analysis.

Descriptions and assembly procedures for some specific raised/elevated racking for commercial buildings are presented.

Energy Storage—Battery Bank Sizing, Care and Troubleshooting Presented by Rolls Battery Engineering

Wednesday March 22, 2017
1:30pm-3:00pm
The Colonnade A
1.5 CEU Credits

Proper selection and sizing of battery banks for off-grid and grid-connected systems will be discussed, as well as inspection and installation, system setup, programming of charging set points, as well as ongoing battery maintenance and care to retain capacity and ensure long cycle life. Identifying charging issues, causes of capacity loss and other troubleshooting techniques will also be covered.

Fronius SnapInverter Installation Best Practices Presented by Fronius USA

Wednesday March 22, 2017
1:30pm-3:00pm
The Colonnade B
1.5 CEU Credits

In this training we will discuss, demonstrate and pinpoint the not-so-obvious methods and applications when installing Fronius Inverter. Culminating a best practices installation and arc mitigation; these are essential topics to know when installing a Fronius inverter in the field and general PV power electronic know-how.

Making Commercial 3-Phase a Snap: OutBack Power's ProHarvest Series as a New Business Opportunity Presented by OutBack Power Technologies

Wednesday March 22, 2017
1:30pm-3:00pm
The Spectrum A
1.5 CEU Credits

With the rapid growth of the commercial PV/solar market driving an equally rapid shift away from large, centralized inverters, there's tremendous demand for faster, more reliable products that are easier to install and configure. Solar installers wishing to maximize their commercial business opportunities will want to check out the new ProHarvest by OutBack Power line, which uses snap together roof-mounted high performance inverter technology that makes it easier than ever to plan, install and commission large commercial systems. This session includes:

- The leading causes of failure in commercial PV systems, and how to avoid them up-front
- How modular-level power electronics (MLPE) systems are poised to take over the commercial PV/solar business
- Basics of planning and installing a ProHarvest by OutBack Power system
- Case studies in success, including large retail stores, solar carports, and much more.

Panasonic HIT Solar Modules: Superior Generation, Unmatched Reliability Presented by Panasonic

Wednesday March 22, 2017
1:30pm to 3:00pm
The Spectrum B
1.5 CEU Credits

Panasonic's history in the PV industry, manufacturing processes, testing standards and an overview of heterojunction solar cells. We'll look at the benefits of this high efficiency solar module with excellent temperature characteristics and unique frame design that maximize power production of the array.

PV Mounting in Asphalt Pitched Roofs Best Practices and Code with Rail-less RT-[E] Mount® Presented by Roof Tech, Inc.

Wednesday March 22, 2017
1:30pm-3:00pm
The Waterford A
1.5 CEU Credits

Discover why more installers choose Roof Tech when they recognize the benefits of its integrated flashing, lower point load, and resistance to thermal contraction and expansion of the array. At this presentation, you will learn about Roof Tech's background, legacy, design approach, NDS code, IBC (International Building Code) and IRC (International Residential Code) Codes, NRCA's (National Roofing Contractors Association) PV mounting guidelines and the rigorous testing that led to Roof Tech's pioneering ICC (International Code Council) evaluation report on its Integrated Flexible Flashing system.

System Design and Optimization with HelioScope Presented by Folsom Labs, Inc.

Wednesday March 22, 2017
1:30pm-3:00pm
The Waterford B
1.5 CEU Credits

In this training, attendees will learn how to use HelioScope software to quickly and effectively design and sell residential and commercial solar projects. This training will cover techniques to save time, to engage with customers for improved closing rates, and to divide work across teams to improve turnaround time. We will also cover best practices for system optimization, and best practices for avoiding design or energy simulation pitfalls. Finally, we will showcase a number of third-party tie-ins that can further increase installer productivity and reduce costs.

Calculating Payback in a Post NEM Market

Sponsored by: inter solar NORTH AMERICA

Moderator: Jeff Spies, Quick Mount PV
INVITED PANEL
John Berdner - HiQ
Corey Garrison - Southface Solar Electric
Michael Bishop - Ongrid

Wednesday March 22, 2017
3:30pm-5:30pm
Lalique Ballroom II
2.0 CEU Credits

Full retail rate net metering has disappeared in Hawaii, California, Arizona, and many other markets. In its place are monthly minimum fees, net metering fees, Time Of Use (TOU) rates, and demand charges. These rapidly evolving rate plans are complicating payback calculation and financial investment analysis. In this panel we will explore these recent changes to utility rates and address new technologies for load shifting and load shaving using energy storage and demand management systems.

Best Practices for Maximizing Software Investments

Sponsored by: FOLSOM LABS

Moderator: Pamela Cargill, Chaolysti Management Consulting
INVITED PANEL
Connor English - PVBid
December Cowen - Unirac
Galina Kofchock - Osceola Energy
Paul Grana - Folsom Labs

Wednesday March 22, 2017
3:30pm-5:30pm
Crystal Ballroom VI
2.0 CEU Credits

As margins shrink and utility rate changes continue to complicate the payback of projects, software tools can help contractors stay organized by automating and tracking key customer, site, and project data. But adopting software is no guarantee of greater margins or more customers. Contractors must also ensure proper use and integration of software into the company's overall process. In this session, attendees will learn

- Common misconceptions when selecting software
- Why and how to build an implementation plan
- How to avoid the most common automation mistakes, particularly in design and proposal tools

Battery Chemistries and System Options—Components or Prepackaged Systems

Sponsored by: Rolls BATTERY ENGINEERING

Moderator: Catherine Kelso, Ambassador Energy
INVITED PANEL
Steve Higgins - Rolls
Greg Smith - Sonnen
Sandra Herrera - Outback Power
Kyle Bulger - Blue Planet Energy

Wednesday March 22, 2017
3:30pm-5:30pm
Crystal Ballroom VII
2.0 CEU Credits

Compare various battery technologies including traditional lead acid, advanced lead acid, lithium iron phosphate, lithium manganese/cobalt, and salt-water battery systems. Evaluate pros and cons of configuring your own combination of batteries and controls versus using one of the new generations of all in one prepackaged systems.

PV Installer Safety

Sponsored by: BayWa r.e. renewable energy

Moderator: Brian Mehalic, Solar Energy International
INVITED PANEL
Guy Snow - G&G systems,
David del Vecchio - SEI

Wednesday March 22, 2017
3:30pm-5:30pm
Crystal Ballroom VIII
2.0 CEU Credits

Installing PV systems is a complex blend of skills from several trades: electrical, roofing, plumbing, and even carpentry. Each has it's own unique hazards. This session will focus on electrical safety and fall protection and evaluate strategies, processes, and products that help insure worker safety.

THURSDAY, MARCH 23, 2017

PV and the 2014/2017 updates NEC

Ryan Mayfield, Renewable Energy Associates

Thursday March 23, 2017
8:00am-4:30pm
Lalique Ballroom II
6.0 CEU Credits

Designed specifically for experienced PV professionals, this course will cover the major code requirements affecting PV installations, focusing on the 2014 NEC. Upon successful completion of this course, participants will have the ability to recognize and implement new code requirements for PV systems. We will also explore what changes to expect in 2017.

PV with Energy Storage for Residential Applications

Roger Williams and Rebekah Hren, Solar Energy International

Thursday March 23, 2017
8:00am-4:30pm
Crystal Ballroom VI
6.0 CEU Credits

Battery-based PV system design and installation is a complex task. This class focuses on system sizing and selecting components for residential grid-tied (multimode) PV systems with energy storage. Load analysis techniques, inverter and controller selection criteria, battery bank specifications and sizing, and National Electrical Code requirements for battery-based systems will be presented.

Economics of Solar

Michael Bishop, OnGrid, Inc.

Thursday March 23, 2017
8:00am-11:30am
Crystal Ballroom VII
3.0 CEU Credits

PV system economics are more complicated than calculating a simple payback based on anticipated power production and avoided energy costs. This course will provide a study of commercial and residential PV economic analysis methods that include utility rate structures, system costs, tax incentives, and finance rate variables as inputs into five different financial analysis methods. Go beyond simple payback and understand Total Lifecycle Payback, Return on Investment, Internal Rate of Return (IRR), Modified IRR, Appraisal Resale Value, and Net Present Value

PV System Maintenance & Trouble Shooting

David del Vecchio and Brian Mehalic, Solar Energy International

Thursday March 23, 2017
8:00am-4:30pm
Crystal Ballroom VIII
6.0 CEU Credits

The goal of PV system operations and maintenance (O&M) is insuring predictable return on investment, PV system longevity, and optimum productivity. O&M is one of the fastest-growing segments of the PV industry, and for good reasons: preventative maintenance helps lower operational costs; reduces system downtime; maintains equipment warranties; and improves system efficiency and energy output. O&M strategies and procedures will be covered, along with tools and techniques used by field technicians for regular maintenance and troubleshooting.

Closing the Loop to Improve Profitability and Efficiency

Connor English, PVBid

Thursday March 23, 2017
1:00pm-4:30pm
Crystal Ballroom VII
3.0 CEU Credits

Solar installers and developers struggle to predict project costs efficiently. A great deal of time is spent acquiring customers and developing proposals, and only 25% of that work converts into profitable sales. After reviewing the different stages of a solar project and how they relate to each other, both in terms of efficiency and profitability, students will explore strategies for faster customer qualification. This includes investigating and evaluating company processes as they relate to estimating. Those methods will then be applied to value engineering principles to make companies more efficient and profitable.

Exhibitor Technical Trainer Bios

John Doerr—APsystems
John contributes over 30 years of experience in management with startups, manufacturing and customer support, as well as national and international consulting. His work includes development and contractor management of commercial, residential and multifamily projects. John provides the pre- and post-sales technical training and supports installer needs for application engineering and design.
John holds a master's degree in finance and economics from the Olin School of Business, Washington University, St. Louis.

Christopher Barrett, Director of Engineering & Technical Services—APsystems
Christopher brings more than 20 years' experience in the solar and semiconductor industries. He most recently worked as Technical Services Manager for SolarBridge Technologies, directing a multinational support center which monitored global PV installations, provided support and dispatched technicians to the field.

He previously held management positions in product marketing, customer and technical support and engineering for Brooks Automation; worked as Global Sourcing Manager for Netmercury Corporation's automated supply chain division; and was Strategic Project Manager for Ferrotec Corp.

Christopher holds a Bachelor of Science (industrial engineering with business management) from Keene State University, and an Associate of Science (electromechanical drafting and design technology) from New Hampshire Technical College."

Terry Holtz—Aquion Energy
Terry Holtz joined Aquion as Senior Application Engineer in March 2015 with 9 years of experience at several leading companies in the energy industry. Prior to Aquion, Terry held several Application Engineering positions at GE Power Conversion from February 2011 to March 2015, where he became an expert in large turn-key power conversion solutions for various industries. Previously, Terry was a Sales Manager for Converteam, a global power conversion company based in France. He holds an M.S. in Electrical Engineering from INSA Strasbourg in France. He currently resides in Pittsburgh, PA, USA.

Sarah Parsons—Burndy, LLC (Wiley)
Wiley Product Manager for Burndy LLC. Entered the solar industry in 2009 working for Wiley Electronics. Moved over to Burndy LLC when they acquired Wiley Electronics in 2011.

Kate Collardson—CertainTeed
Kate Collardson has worked in the solar industry since 2006 as an installer, designer, project manager, trainer, and program manager. She earned her NABCEP PV Installation Professional credential in 2009. She currently serves on the board of COSEIA (Colorado Solar Energy Industries Association) and is completing the Boulder County Leadership Fellows program. She has a B.A. in German from Colorado College and an MBA, with a Certificate in Sustainable Technology, from Arizona State University.

Shawn Schmidt—eGauge Systems, LLC
Shawn has been working as a technical support specialist at eGauge for four years and has now joined the sales team as a Technical Sales advisor. He leads training seminars and webinars throughout the US.

Peter Lum—Enphase Energy
Peter is a technical training professional with over 20 years of technical experience in hi-tech and renewable energy. Peter manages, develops and delivers training for Enphase Energy globally and has also managed and delivered technical training at Fat Spaniel Technologies, and Hewlett Packard. He also is a Assistant Professor in the California college system where he teaches Solar technology, Design, and Sales

Paul Grana—Folsom Labs, Inc.
Paul Grana is the co-founder and Chief Revenue Officer of Folsom Labs, where he runs marketing, support, and sales. He also organizes the Solar Software Summit, the annual show dedicated to software tools for the solar industry. Previously, he ran Product Marketing at Tigo Energy, eIQ Energy and Abound Solar, and is the lead inventor on a patent regarding combiner box design. He holds an SB in Mathematics from the University of Chicago, and an MBA from Harvard Business School.

Emmitt Muckles—Fronius USA LLC, Solar Energy Division
Fall 2010, Emmitt Muckles joined with Fronius USA in Brighton, Michigan as Technical support and Technical trainer for the Fronius Solar Division. After coming aboard with Fronius Emmitt has progressed to lead Trainer for Field Service, trainings and the Fronius Field Service Program referred as Fronius Service Provider (FSP).

Emmitt has work in the technical fields of Cytometers, Spectroscopy and even Gaming. Providing training and field service for companies such as MGM Grand , John Deer, Chrysler, General Motors, and General Electric's Nuclear division to name a few. "

Mark Mrohs—Interplay Learning
Mark Mrohs is a preeminent expert in solar photovoltaic training, having worked in PV for over 40 years and conducted training programs in over 20 countries. Mark is now the Solar Program Manager at Interplay leading the design of the Solar Training Platform. He has designed and directed the training programs for SunEdison, EchoFirst and SunPower, and previously for AstroPower and GE Solar as well as Siemens Solar and ARCO Solar. He has degrees in Physics and Educational Psychology & Instructional Technology and also serves on the NABCEP Exam Review Committee.

Dan Felix—IronRidge, Inc.
An electrical contractor in CA, AZ, and NM, Dan has 21 years of experience as a solar PV installer and designer. In addition, Dan has been the Training Manager at IronRidge for the past 4 years, teaching best practices in the installation and design of solar PV systems to solar installers.

Tony Zante—ISA Corp.
Tony Zante is President and CEO of ISA Corporation, a solar manufacturing and distribution firm specializing in manufacturing solar mounting equipment for roof and ground applications. Mr. Zante has developed and is currently manufacturing specialized solar mounting products for commercial buildings. Mr. Zante also provides engineering services to help contractors with their solar installations including structural analysis and support. Mr. Zante holds patents and pending patents for elevated and tiltable racking systems and module clamping components.

Mr. Zante holds a Bachelor's Degree in Mechanical Engineering from Fresno State University and is member of the American Society of Mechanical Engineers, ASHRAE, and Solar Energy Industries Association."

Alan Santos-Buch—Magnum Energy
Alan Santos-Buch is the Western Regional Sales and Marketing Manager for Renewable Energy at Magnum Energy, now a Sensata Technologies product brand. Since 2011, Alan has been providing technical sales, training and support for distributors, dealers and installers of Magnum Energy products. He obtained a NABCEP certification in solar design and installation in 2007, and a battery based installation certification from SEI, in Paonia, CO in 2012. Alan has over 10 years' experience in the power conversion manufacturing business. He received a BBA degree from SMU in Dallas, Texas, in 1986. Alan works beside the design engineers and technical support team in Everett, WA.

Ryan Stankevitz—MidNite Solar, Inc
Ryan is a licensed Master Electrician with 28 years of experience, he is also an avid amateur radio operator and has been installing Solar Systems for the last 18 years. Ryan currently works for MidNite Solar as their technical sales person

Roy Butler—MidNite Solar, Inc
Roy Butler is the Technical Support Manager for Midnite Solar, the founder of Four Winds Renewable Energy and a NABCEP certified PV installer. He has 20 years of system integration and installation experience with grid-tied and off-grid wind and PV electric systems. His home and business have been off-grid, powered by wind and solar PV since 1997.

Roy currently sits on the board of the North American Board of Certified Energy Practitioners (NABCEP), and is a past board member of the Small Wind Certification Council (SWCC) and the Distributed Wind Energy Association (DWEA).

Brad Berwald—Morningstar Corporation
As Product Manager, Brad brings over 14 years of technical sales experience in the RE power electronics industry to Morningstar Corporation. Brad joined Morningstar in 2002 as a Sales Engineer. His expertise in Global Account Management, Technical Marketing & Training, as well as product development has enabled him to grow and take on many new challenges at Morningstar. In his current role, Brad is helping Morningstar grow its international business and guide its product portfolio to meet the evolving needs of the remote power industry.

Brad holds a BSEE and a Marketing-focused MBA from Alfred University. His contributions have assisted Morningstar Corporation in becoming the world's leader in solar charge controllers and inverters.

Michael Bishop—OnGrid, Inc.
Michael Bishop is President and CEO of OnGrid. Since 2005, OnGrid offers data, software, and education for distributed solar financial modeling and presentation. Michael has led OnGrid's software development since 2006. Through this work, Michael has gained a deep understanding of utility rate structures, solar compensation, and electric bill savings modeling. Michael teaches solar financial modeling in various contexts. Michael's core purpose is to help solar professionals provide best-in-class financial presentations and reporting as efficiently as possible. Michael takes special interest in personal effectiveness and the U.S. transition to a smarter electric grid.

Sandra Herrera—OutBack Power Technologies
Sandra Herrera is the Applications Engineering and Technical Support Manager at Outback Power Technologies. With over 10 years of experience in the renewable energy business, she has supported projects at both residential and commercial scale, with emphasis on battery-based systems. Sandra has a degree from DuocUC in Santiago, Chile.

Chris Brown—Panasonic
Chris Brown is passionate about the solar industry and enthusiastic about sustainable solutions through technology and innovation. After completing his undergraduate education at the University of Massachusetts, Amherst, Chris entered into technical sales of alternative energy products at the altE Store. Two years later he joined Kyocera Solar to focus on sales and project development in the East Coast. Recently Chris was the Director of Sales for Soligent Distribution, the country's largest pure play solar distributor, leading a team of sales professionals across North America. Chris joined Panasonic Eco Solutions in 2016 with over ten years of experience in renewable energy sales and business development. Chris lives in Acton, Massachusetts with his wife Julie and his dog Baxter and recently installed a solar electric system on his house, featuring the Panasonic HIT 325 solar modules.

Chip Means—Pika
Chip Means leads Pika Energy's marketing and media-related activities. He speaks at solar industry events throughout North America to educate installer audiences about the simplicity of DC bus-based solar-plus-storage. A native of Boston, he spent the first decade of his career in media, first at EBSCO Publishing and then at HIMSS Media. Chip earned a BA in English from Bates College.

Jeremy Niles—Pika
Jeremy Niles builds and tests Pika Energy's production design materials, marketing collateral and customer support materials, including instruction manuals, websites and diagrams. Jeremy earned a BS in Business Administration at the AACSB accredited USM school of business. When he is not working, Jeremy can be found far away on his motorcycle, or chasing fish on Maine's beautiful shores and waterways.

Dan Kelly—PROINSO
Dan Kelly is a degreed engineer with experience as a safety product specialist, technical author and product engineer. His longtime working relationship with Omron spans from distribution to corporate levels supporting a variety of products including solar, safety and other control equipment.

Connor English—PVBid
For the past decade, Connor has worked extensively on PV and Solar Thermal systems from the ground up – designing, building, engineering, and costing. He has developed tools to enable better designs, more accurate costs, and financial analysis for the sales teams he supported. He founded PVBid, a solar specific web-based estimating app, and has become a recognized expert in solar estimating.

Jeff Spies—Quick Mount PV
Jeff Spies: Sr Director Policy Quick Mount PV
Jeff Spies has been on the forefront of solar training since his entry into the PV industry in 2007. Thousands of contractors and installers have attended his popular online trainings and live training events and he is a regular speaker at major industry trade shows and conferences including Solar Power International, Intersolar, and the Midwest Renewable Energy Fair. He holds a B.S. in Mechanical Engineering and has worked in sales, marketing, and technical training for 30 years. Jeff also serves as Secretary for NABCEP, leads the Task Group on Bonding and Grounding for the UL 2703 standard for Rack Mount PV Systems, and serves as Chairman of the Codes/Standard Committee for the California Solar Energy Industry Association (CALSEIA).

Johan Alfsen—Quick Mount PV
Johan Alfsen has been in the solar industry since 2004 when he became an installer in the San Francisco Bay Area. In his roles as speaker, trainer, and author of various articles on roof penetrations and code compliance for residential solar installations, Johan has become known industry wide for his passionate advocacy of solar roofing best practices. He sits on the Board of Directors for Roof Integrated Solar Energy (RISE) as well as the Resource Guide Committee for the North American Board of Certified Energy Practitioners (NABCEP) and was recently certified by the Tile Roofing Institute (TRI). Johan holds a degree in Environmental Sustainability and Social Justice.

Exhibitor Technical Trainer Bios

Ryan Mayfield—Renewable Energy Associates
Mr. Mayfield has been working in the renewable energy field since 1999 and currently focuses on commercial photovoltaic (PV) system design and education. As the President at Renewable Energy Associates, he provides design, support and educational services for architectural and engineering firms, contractors, manufacturers and government agencies. Typical projects include commercial and residential PV system designs and training PV system designers and installers. Mr. Mayfield also works directly with manufacturers of PV-specific products to help gain market acceptance and develop products that directly help the implementation and use of their products. Mr. Mayfield serves as Photovoltaic Systems Technical Editor for SolarPro magazine, regularly writing feature articles in SolarPro and Home Power magazines; he is also the author of PV Design and Installation for Dummies (published in 2010). Ryan also teaches various PV courses across the nation for electricians, existing solar professionals, code officials, inspectors and individuals looking to join the solar industry. Class topics include National Electrical Code, Oregon Solar Code and PV systems, commercial PV systems, and preparation for the North American Board of Certified Energy Practitioners (NABCEP) exams. Ryan holds a Limited Renewable Energy Technician (LRT) license in Oregon.

Steve Higgins—Rolls Battery Engineering
Steve Higgins, Technical Services Manager for Rolls Battery Engineering, has spent the last two decades working in Renewable Energy business helping with the design, sales and troubleshooting of battery-based systems all over the world. During this time, Steve has been working to educate Installers and Integrators on inverter repair, proper system sizing and system design, operation, maintenance and troubleshooting of battery-battery based Renewable Energy systems.

Milton Nogueira—Roof Tech, Inc.
Milton Nogueira has been an advocate of solar energy for nearly three decades and has extensive experience in photovoltaic system design and sales. In early 2013, he joined Roof Tech in their first U.S. operation. In his role as Senior Business Development Manager, Milton cultivates new business opportunities nationwide through training and outreach and oversees the company's marketing, compliance and technical activities. Previously, Milton worked for 17 years as a sales engineer for a major distributor of solar photovoltaic systems in Northern California. He is a former board member of the Northern California Solar Energy Association and holds a C-46 California contractor's license. Milton earned his bachelor of science in mechanical engineering from the University of Santa Catarina in Joinville, Brazil.

Dustin Haddock—S-5!
Dustin is the VP Research & Development, S-5! Attachment Solutions, Metal Roof Innovations, and Chair of the SEIA Mounting System Manufacturers Committee. Dustin has collaborated and led many efforts in standards and codes development with organizations which include the ICC, UL, and Intertek and universities and institutes such as the University of Adelaide and the Karlsruhe Institute of Technology in the fields of metal roofing, roofing attachments and racking and mounting systems. In addition to chairing SEIA's mounting systems manufacturers committee, Dustin also chairs the UL Non-Combustible Roof Group of the MBMA Insurance Committee, serves on the UL 2703 and UL 1703 Standards Technical Panels and the Microgeneration Certification Scheme (MCS) Roofing Work Group. He has 5 issued patents and more than 10 patents on file or pending domestically and internationally.

Eric Bentsen—Schneider Electric
I have been with Schneider Electric since 2004. I was in a Technical Support role for over 10 years. There is rarely a situation or application that I haven't encountered. This experience has proven invaluable with intimate product knowledge translating to strong support for pre-sales inquiries. This past year as an SAE has given me wonderful opportunities to train distributors and installers in the functions, features and benefits of the Conext platform.

Cameron Stewart—SolarEdge, North America
Cameron Stewart's mission is to educate PV installers and Authorities Having Jurisdiction about the safety and benefits of SolarEdge's products. Prior to joining SolarEdge, Stewart has held a myriad of positions in the solar industry. For example, he was a training specialist with Power-One/ABB, field supervisor at American Solar Electric, and at SOLON Stewart serviced and diagnosed problems with utility scale systems. Stewart holds a B.S. in Chemistry from Arizona State University and earned a OSHA10 certification. Outside of work, Cameron enjoys the outdoors, his two dogs, and is currently restoring a 1961 Triumph TR3A.

David Del Vecchio—Solar Energy International (SEI)
David Del Vecchio is a graduate of Georgia Institute of Technology with a Bachelors in Mechanical Engineering. He entered the PV industry in 1998 in North Carolina designing, installing and managing off-grid installations. Since 2005, David is President of Solar Seed, Inc. performing design, 3rd party QA and inspections, commissioning, troubleshooting as well as in house training for residential, commercial and utility PV system integrators. While Senior Engineer at Strata Solar, David was responsible for quality control from equipment specification, engineering drawings, construction through commissioning and O&M on over 250MW. David is a NABCEP Certified PV Installation Professional since 2005 and IREC Certified Master Trainer in PV since 2010. David is also the primary instructor since 2006 for PV courses at the North Carolina Solar Center at NC State University. David started teaching for Solar Energy International in 2008.

Rebekah Hren—Solar Energy International (SEI)
Rebekah Hren has been teaching PV workshops for Solar Energy International since 2007. A North Carolina native, her first PV system was a 300 watt array for her own off-grid cob house. She worked as a residential system installer and designer for Honey Electric Solar, and now works with O2energies on utility scale arrays. Her focus is quality control, Code-compliance, and maintenance. Rebekah is a licensed electrician and NABCEP Certified PV Installation Professional. She frequently writes technical articles for Home Power and SolarPro magazines, and has co-authored several books: A Solar Buyer's Guide for Home and Office, and The Carbon-Free Home. Rebekah spends a lot of her free time pondering the meaning of the National Electrical Code.

Brian Mehalic—Solar Energy International (SEI)
Brian Mehalic is a NABCEP-certified PV professional and IREC-certified PV instructor with over 12 years of experience designing, installing, servicing, and inspecting all types and sizes of PV systems. He began his career as Lead Installer and Project Manager at EV Solar Products in Arizona, where he was directly responsible for the design and installation of over 150 photovoltaic systems, ranging from residential off-grid to commercial grid-interactive. For the past several years he worked as Project Engineer for O2 Energies in North Carolina, advising the developer on system design, modeling performance, and performing quality assurance inspections on over 23 megawatts of ground-mounted PV. Currently he is a curriculum developer and instructor for Solar Energy International and North Carolina State University, a frequent contributor to SolarPro and Home Power magazines, and an independent consultant providing services ranging from system design and quality assurance inspections to commissioning, troubleshooting, and maintenance.

Roger Williams — Solar Energy Interntional (SEI)
Roger is a member of SEI's PV Curriculum Development Team and a workshop Instructor. He has had a long-time passion for solar energy - beginning with Mom's clothesline back in the 70's. Since 2002, after a summer of workshops and some hands-on work with SEI, Roger has worked full-time in the PV industry, predominantly in California, and has been a NABCEP Certified PV Installer since 2007. He began as an installer, later working as a foreman, site superintendent and project manager, primarily on grid-direct systems - from small residential to 1 MW commercial systems. He has also performed solar-specific site analysis, troubleshooting, quality assurance and operations and maintenance tasks on thousands of PV sites. Roger is passionate about spreading the understanding and usage of solar power, in addition to teaching best practices for safe, high-quality, NEC compliant PV installations. Currently enjoying the fine food, culture, small waves and bike-friendly routes of the San Francisco Bay Area, Roger can be found late at night playing hockey at Oakland Ice, under 300 kilowatts of PV.

Anthony Conklin — Solar-Log
Anthony Conklin is President of Solar Data Systems, the makers of Solar-Log. Anthony is a 10-year veteran in the solar industry, both in the residential and commercial sector. He is an executive sales leader, mentor, speaker and renewable energy enthusiast with a superb knowledge of EPC and utility business. He has served as a solar industry expert and panelist for many organizations including the New York Beer and Wine Association, Columbia University School of Engineering and Solar Investment & Finance USA.

Dan O'Brien — Solar-Log
Dan O'Brien is a 10-year solar industry veteran in the residential and commercial sectors. His experience encompasses development, equipment sales and management. Dan is passionate about clean energy and believes in the importance of sustainability for future generations. He enjoys helping installers and plant owners maximize their solar PV investments through Solar-Log's innovative monitoring, data acquisition, and fleet management solutions.

Russell Eisenman — SolarRoofHook
Russell Eisenman is an Outside Sales person for SolarRoofHook. In less than 5 years, Russell has become one of the company's top salespeople. Starting out in Marketing for Quickscrews, our parent company, Russell was able to take his knowledge of wood fasteners and apply it to our Solar Mounting technology. His drive to solve installers' problems has been an important factor in SolarRoofHook's ability to make solar more affordable. Good conversation starters with Russell are sports and traveling, he would love to converse with you about either of these topics.

Greg Smith — sonnen, Inc.
Greg Smith is the Senior Technical Trainer for sonnen, Inc. in the United States. He is responsible for training and certifying sonnenBatterie installation partners on the proper deployment of sonnen's battery energy storage systems in residential and commercial applications. Greg has 8 years of experience in solar and battery based systems and is well known throughout the industry as an experienced and enthusiastic speaker and trainer. Prior to his position at sonnen, Greg was the Senior Technical Trainer for the SMA America Solar Academy. He is also a 20-year veteran of the US Navy and served as a submarine Sonar Technician and Master Training Specialist.

Exhibitor Technical Trainer Bios

Brandon Gwinner—SunModo Corp.
Brandon Gwinner, recently promoted to Senior Account Executive, is responsible for developing and implementing SunModo's distribution and sales strategies in the West region. Brandon has been with SunModo for 6 years in the solar and renewable energy industry with a track record of being the top producer. Brandon brings to SunModo extensive experience in sales management, customer relations, support, service & lives and works by the golden rule, "Due unto others, as you want done unto you". Before SunModo, Brandon held sales positions with Verizon and Clear Channel Radio. Outside of work, he enjoys Snowboarding, Fishing, Camping, Surfing around the world and spending as much time as possible with his Brazilian wife of 7 years, 3 year old son Zachary and 2 year old son Noah.

Stacey Delzeit—Trojan Battery Company
Senior Applications Engineer
As a part of Trojan's Technical Solutions Group, Stacey Delzeit is responsible for addressing technical questions from around the world via Trojan's toll-free technical support hotline and the company's Website. As senior applications engineer, she participates in customer visits to address application issues that may arise in the field, and works with Trojan's sales team to offer application support. Delzeit also provides Web-based or on-site training to Trojan's distributors and customers.

Delzeit previously served as a product engineer with Trojan and performed battery charger testing, evaluated customer product returns and analyzed warranty claims from Trojan's original equipment manufacturer (OEM) customers. Prior to joining Trojan in 2007, she served as an industrial engineer and process engineer at a division of Yuasa Battery, which is now known as EnerSys.

Delzeit received her bachelor of science degree in engineering from Mercer University in Macon, Georgia.

Steve Bauer—Unirac, Inc
Steve brings more than 20 years of structural engineering experience to the safe development and application of solar racking structures. Steve guides a team of talented engineers and designers in creating innovative, cost-effective, and compliant products for all facets of the solar industry. Prior to joining Unirac, Steve served as Structural Engineer of Record engineering large-scale, complicated medical and hospitality structures across the United States. Steve is active in the Structural Engineers Association of California (SEAOC) Solar Photovoltaic Committee, as well as the SEIA Codes and Standards Working Group and the newly formed SEIA Mounting Systems Manufacturing Committee.

Michael Nieman—Yaskawa-Solectria Solar
Michael Nieman joined Yaskawa - Solectria Solar's Applications Engineer Team in 2015. He is based out of Solectria's West Coast office in Huntington Beach, CA. Michael has over eight years of experience in the solar power and electrical construction industries. Michael graduated from the University of San Diego with an Electrical Engineering degree and holds an FE/EIT certificate from the California Board for Professional Engineers.

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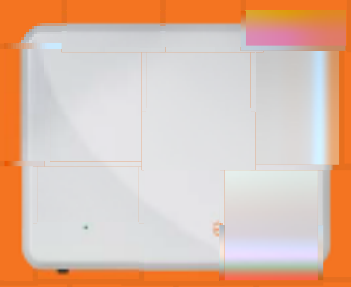

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