



ASES SOLAR 2019

Race to Renewables Official Conference Program



August 5-9
Minneapolis, MN

Crowne Plaza AiRE

ases.org/conference

#SOLAR2019TwinCities

ASES SOLAR 2019

Race to Renewables



48th Annual National Solar Conference



MINNEAPOLIS, MN
August 5-9
#SOLAR2019TwinCities

NABCEP Courses - Wright Suite

SEATS AVAILABLE

NABCEP Battery-Based PV System Design

Thursday August 8, 4:30pm - 8:30pm

NABCEP Battery-Based PV System Design

Thursday August 8, 4:30pm - 8:30pm

NABCEP PV Sales & Finance

Friday August 9, 9:00am - 5:00pm

SOLAR POWERED BREWERY TOUR

August 8th 5:30pm | Crowne Plaza AiRE



Come on an electric bus tour of three sustainable and renewable powered breweries around the Twin Cities! The tour will take place on the second to last day of the American Solar Energy Society 2019 Solar Conference. You can also register to join all the excitement at www.ases.org/conference

Insight Brewing

61 Heliene Solar Panels -- Nominal Power 325 W -- System Size 19.83 W -- Installed by IPS Solar -- Mounting System: Ballasted -- Expected Average Annual Electricity Production: 23,597.7 kWh -- Insight is also subscribed to a community solar garden!

ABLE Brewery + Seedhouse

118 Heliene Solar Panels -- System Size: 33.04 kW -- Installed in 2017 by IPS Solar -- Mounting System: Ballasted -- Expected Average Annual Electricity Production: 39,317.6 kWh

Utepils Brewing

221 Heliene Solar Panels -- System Size: 80.7 kWh -- Installed in 2019 by IPS Solar -- Mounting System: Ballasted -- Expected Average Annual Electricity Production: 96,033 kWh



Erase your travel carbon footprint at ases.org/conference/lodging.

100% of the electricity for the conference is being supplied by renewable energy sources, sponsored by Xcel Energy Windsource. Learn more at xcelenergy.com/renewables.

EVENTS:

Monday

Divisions Meeting

1:15pm - 2:45pm Wright Suite

Electric Avenue

4:00pm - 6:30pm Top Level of Parking Garage

Opening Reception

6:00pm - 9:00pm AiRE Ballroom

Tuesday

Emerging Professionals Meetup

12:15pm - 1:00pm AiRE Ballroom

Poster Session

3:15pm - 5pm Common Area

ASES Awards Banquet

6:00pm - 9:00pm AiRE Ballroom

Wednesday

WISE Luncheon

12:15pm - 1:45pm AiRE Ballroom

Minneapolis River Boat Cruise

5:15pm - 10:00pm Meet at hotel front lobby

Thursday

Solar Powered Minneapolis Projects Tour

1:30pm - 4:30pm Meet: hotel front lobby

Solar Powered Brewery Tour

5:30pm - 8:30pm Meet: hotel front lobby

Welcome

FROM THE CONFERENCE CHAIR,

JOHN DUNLOP

PRINCIPAL, RENEWABLE ENERGY SERVICES LLC

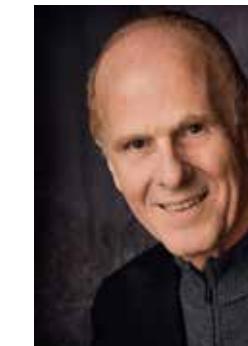
The American Solar Energy Society believes that supplying 100% of America's electricity with renewable energy is not only possible but urgently necessary. We need to decarbonize our economy in order to have any chance of constraining the global temperature increase to less than 2 °C, which in itself will be disruptive to humankind.

ASES represents the scientists, educators, and activists who can provide renewable energy technologies and solutions for climate action in the United States that will have an immediate and large scale impact. The ASES SOLAR 2019 Conference will focus on those strategies.

The door for impacting climate change is rapidly closing. ASES intends to be a loud voice to follow the lead of states and cities across the country to decarbonize the nation's electricity supply and make an impact while that door is still open. We are in a race against time, and ASES believes we can win that race.

The ASES SOLAR 2019 Conference will be held in one of the leading states for taking climate action, Minnesota. Minnesota has enacted climate policies that have provided leadership in the growth of wind power, solar power, community solar, variable generation integration technologies, energy efficient buildings and electrifying the transportation sector. But the strategies and solutions that will be presented at the conference can – and must – be implemented across the country. Minnesota is pleased to host this important conference on taking climate action.

Many strategies will be necessary to take immediate climate action: Electricity supply (residential, commercial, industrial, utility-scale solar; on land wind power; offshore wind power); transmission (including a national HVDC grid); electrifying the economy (transportation, homes, businesses, buildings); policies (international, national, state, intra-state, city); public support (social media; popular press, education); personal actions (renewable energy opportunities; energy efficiency, electric vehicles). Thank you for joining us as we advance clean energy now.



Thank You SOLAR 2019 Program Leaders, Volunteers, and ASES Staff!

SOLAR 2019 NATIONAL ORGANIZING COMMITTEE

John Dunlop, Conference Chair
Carly Cipolla, Conference Coordinator

Paulette Middleton, ASES Secretary

Elaine Hebert, ASES Treasurer

Carly Rixham, ASES Executive Director
Lucas Dixon, ASES Chair

Doug Shoemaker, MRES Director
Mark Weber, MRES Director

David Comis, Awards Chair
Gina Johnson, Fellows Chair

Marlene Brown, WISE Luncheon
Kaycee Chang, Emerging Professionals

David Panich, AIA Certification

SOLAR 2019 VOLUNTEERS

Lynn Albers	Sarah Grace
Eric Barry	Donald Hanson
Marlene Brown	Frank Kelly
Gail Burrington	Barbara Lunde
Kaycee Chang	Mario Monesterio
Cary Church	Morrine Omolo
Jill Cliburn	Steven Read
Laura Cina	John Richter
John Dunlop	Lucy Stolzenburg
Drew Gillett	Earl Wilson

ASES STAFF

Carly Rixham, Executive Director	
Carly Cipolla, Director of Operations	
Sarah Townes, Finance Manager	
Eva Coringrato, Membership Assistant	
Sunshine Urbaniak, Web Design	
Tiffiny Harrower, Finance & Accts. Mgr.	
Heddie Hall, Tiny Watts Intern	
Christina Menchaca, Membership Intern	
Mike Derderian, Social Media Intern	
Izzy Sofio, Fundraising and Editor Intern	

A big thank you to all of our session presenters, moderators, forum organizers, and all participants.

At-A-Glance

Monday, August 5, 2019

9:00am - 12:00pm	Chapter Caucus: Chapter Leaders and ASES Staff	Wright Suite	10:45am - 12:15pm
1:15pm - 2:45pm	Divisions Meeting: All Welcome	Wright Suite	10:45am - 12:15pm
3:15pm - 5:30pm	Volunteer Training	Runway Room 2-4	12:15pm - 1:45pm
4:00pm - 6:30pm	Electric Avenue	Top Level Parking Garage	1:45pm - 3:15pm
6:00pm - 9:00pm	Opening Reception	AiRE Ballroom	1:45pm - 3:15pm

Tuesday, August 6, 2019

9:00am - 10:30am	Keynote: Aggressive Climate Action – Leadership from International to Local	AiRE Ballroom	3:30pm - 5:00pm
10:45am - 12:15pm	Keynote: Aggressive Climate Action - Cont.	AiRE Ballroom	3:30pm - 5:00pm
12:15pm - 1:00pm	Emerging Professionals Meet-Up	AiRE Ballroom	5:15pm - 10:00pm
1:30pm - 3:00pm	Public Acceptance and Action Track: Community Climate Action Programs	Wright Suite	
1:30pm - 3:00pm	Technical Track: PV Storage and Implementation	AiRE Ballroom	9:00am - 10:00am
1:30pm - 3:00pm	Policy Track: Practical Climate Actions	Runway Rooms 2-4	10:00am - 10:40am
3:15pm - 5:00pm	Poster Session (see page 10)	Common Area	11:05am - 11:40am
5:00pm - 6:00pm	Fellows Reception (Invitation Only)	AiRE Ballroom	12:00pm - 1:30pm
6:00pm - 9:00pm	Annual ASES Awards Banquet (tickets available)	AiRE Ballroom	12:00pm - 4:00pm

Wednesday, August 7, 2019

9:00am - 9:20am	Keynote: Essential Minerals	AiRE Ballroom	1:30pm - 4:30pm
9:30am - 10:30am	Technical Track: Resource Assessment	AiRE Ballroom	4:30pm - 8:30pm
9:30am - 10:30am	Policy Track: Climate Action and Public Health	Runway Rooms 2-4	5:30pm - 8:30pm
9:30am - 10:30am	Public Acceptance and Action Track: Solar Commons Forum	Wright Suite	
10:45am - 12:15pm	Public Acceptance and Action Track: Communicating Climate Action Forum	AiRE Ballroom	

Technical Track: Electrification of Transportation
Forum: Market Transformation Vectors for Cities, Businesses, Industry

Wright Suite

Policy Track: Solar Homes

Runway Rooms 2-4

Women in Solar Energy (WISE) Luncheon
 (tickets available)

AiRE Ballroom

Technical Track: Transportation

AiRE Ballroom

Policy Track: Solar Buildings /Community Solar

Runway Rooms 2-4

Public Acceptance and Action Track: Personal Climate Actions

Wright Suite

Maximizing Value of Climate Actions Forum

AiRE Ballroom

Policy Track: Climate Action through Community Solar Forum

Wright Suite

Minneapolis Queen Cruise (tickets available)

Hotel front desk/lobby

Thursday, August 8, 2019

9:00am - 10:00am	Climate Action Quick Shots (~switch)	AiRE Ballroom
10:00am - 10:40am	Conference Highlights and Call to Action	AiRE Ballroom
11:05am - 11:40am	Charged up for Action: UN Climate Conference	AiRE Ballroom
12:00pm - 1:30pm	ASES Annual Membership Meeting & Lunch	AiRE Ballroom
12:00pm - 4:00pm	NABCEP Intro to Solar Advisory Model (SAM) PV 430 (seats available)	Wright Suite

Electric Bus Tour of City of Minneapolis Solar Projects (tickets available)

Hotel front desk/lobby

NABCEP Battery-Based PV System Design
(PV 230) (seats available)

Wright Suite

Electric Bus Pub Crawl of Solar-Powered Microbreweries (tickets available)

Hotel front desk/lobby

Friday, August 9, 2019

NABCEP PV Sales & Finance (PV 203) (seats available)

Wright Suite



48th Annual National Solar Conference



MINNEAPOLIS, MN
August 5–9
#SOLAR2019TwinCities

Tuesday, August 6, 2019

Keynote: Aggressive Climate Action – Leadership from International to Local

9:00am - 10:30am
AiRE Ballroom
Moderator: Paulette Middleton



Many strategies will be necessary to take immediate climate action: Electricity supply; transmission; electrifying the economy; policies; public support; personal actions. All need to be focused on taking meaningful action within the next five years. The opening plenary session will provide informative and inspirational overviews of effective, innovative actions at the international, national, state and local levels across a variety of sectors.

- Lucas Dixon
- John Dunlop
- Minneapolis Mayor Jacob Frey
- Dr. Dave Renne
- Dr. Jonathan Foley
- Larry Shirley

Keynote: Aggressive Climate Action – Continued

10:45am - 12:15pm
AiRE Ballroom
Moderator: Paulette Middleton

- Kim Havey (City of Minneapolis Climate Actions)
- Kevin O'Rourke (Ramping up Renewables)
- Dr. James McCalley (Transmission for Renewables)
- Gregg Mast (Business Case for Investing in Climate Action)
- J. Drake Hamilton (Succeeding in Dramatic Climate Action)

Emerging Professionals Meet-Up

12:15pm - 1:00pm
AiRE Ballroom
Moderator: Kaycee Chang

Luncheon intended to provide networking, mentoring, education and career growth opportunities and is open to industry professionals, recent graduates, and students.

- Ben Adamich
- Christopher Milliren
- Kaycee Chang
- Zach Emond

REGISTRATION: Control Tower
2nd floor Crowne Plaza AiRE
Monday 5:45pm-7:30pm
Tuesday & Wednesday 8am-6pm
Thursday 8am-Noon

Opening Reception

6:00pm - 9:00pm
AiRE Ballroom

Public Acceptance and Action Track: Community Climate Action Programs

1:30pm - 3:00pm Wright Suite
Moderator: Wyldon Fishman

Today's urgent climate action doubles up technical and professional guidance with an approach to meet the needs of STEM students, undergrads, small businesses and workforce career development for those of us "left behind". Navigate urban-rural divide: collaboration with rural farmers includes solutions for agribusinesses which accounts for one third of total greenhouse gas emissions worldwide. Results and recommendations for "greening" milk by making a dairy milking parlor Net Zero will be presented. Ready-to-share stakeholder tools are ready for you to address developing engagement in sustainability programs.

- John Bleem (CSU Simplified PV Modeling)
- Mia Devine (Rural Community RE Development)
- Eric Buchanan (MN Morris Dairy Renewable Program)
- Meghan Hoskins (Solar Across Pennsylvania)

Technical Track: PV Storage and Implementation

1:30pm - 3:00pm
AiRE Ballroom
Moderator: Jill Cliburn

The session will focus on best practices in system commissioning of solar PV system, and economics of energy storage systems. The speaker will discuss the importance of standards related to PV plant commissioning, best practices, and most common inspection and failures found during commissioning of the solar PV projects. The session will also highlight the importance of energy storage technology in fully renewable electricity grids, and the differing economic characteristics of various energy storage technologies.

- David Timmons (electric energy storage)
- Jeff Gilbert (PV commissioning)

Policy Track: Practical Climate Actions

1:30pm - 3:00pm
Runway Rooms 2-4
Moderator: Stacy Miller

At least 8 states and territories plus D.C. have adopted 90-100% renewable or clean energy standards with more expected to follow. This session will feature practical insights for meeting these advanced goals, including emerging ideas about regulatory and finance innovations that support energy affordability and equity.

- Josh Quinnell (MN Solar Pathway Dispatchable Renewables)

(cont.)

- Blake Jones (Clean Energy Credit Union)
- Brett Weal (Financing Solar Post 2019 ITC)

Poster Session (see page 10)

3:15pm - 5:00pm
Common Area (Pre-function area)

Fellows Reception (Invitation Only)

5:00pm - 6:00pm
AiRE Ballroom

Annual ASES Awards Banquet (tickets available)

6:00pm - 9:00pm
AiRE Ballroom

Please join us for a special dinner and award presentations, followed by an auction fundraiser at this not-to-be-missed event.

- Carly Rixham, Welcome
- David Comis, ASES Awards Presentation
- Charlie Gay, Abbot Award Winner
- Wyldon Fishman, Izzy Sofio - Live Auction
- Sarah Townes, Lucas Dixon - ASES FUNdraiser & Board Match

Wednesday, August 7, 2019

Keynote: Essential Minerals

9:00am - 9:20am
AiRE Ballroom
Moderator: John Dunlop

One of the grand challenges of decarbonization is to balance our global dream to electrify everything with the brutal fact that clean energy technologies depend on metals mined using nearly medieval techniques around the globe. This presentation examines the politics of securing critical minerals for climate solutions, in the context of a growing trade war with China. Dozens of new precious and rare earth mines are being prospected throughout the US to meet the metal needs for electric vehicles, solar and wind technologies. These mines have also met growing opposition from Minnesota to Texas as communities express their concern for the devastating local contamination that might result. Dr. Phadke will discuss how we might solve this green energy paradox by repatriating mining, revolutionizing recycling and supporting the nascent right to repair movement.

- Roopal Phadke

Wednesday, August 7 (cont.)

Technical Track: Resource Assessment

9:30am - 10:30am

AiRE Ballroom

Moderator: Robert Foster

This session will update on the latest solar resource databases as well as solar energy forecast techniques for power plants. Good solar forecasts are especially important for utility grid operators to better integrate solar into their overall power generation planning.

- Richard Perez (Resource Assessment)
- Marc Perez (Resource Assessment)
- Paul Stackhouse (Solar Resource, Surface Temperature and Humidity Variability Using NASA Satelite Data)

Policy Track: Climate Action and Public Health

9:30am - 10:30am

Runway Rooms 2-4

Moderator: Elaine Hebert

This session will cover two main topic areas: renewable energy policy and incentives viewed through the lens of public health, and collaboration among adjacent government entities as a means of decarbonizing the local energy grid. UW-Madison Extension. Prof. Holloway's studies found that "energy system change is rarely included in air quality planning... Solar energy offers a huge opportunity to connect with existing fair quality policy, and to provide immediate benefits to public health." Mr. Hanlon will discuss a case study of a municipal solar incentive and reinvestment program that is based on enhancing public health. Ms. Gruder will report on successes in a collaboration among municipalities within a county on moving renewable energy and decarbonization goals forward.

- Tracey Holloway (Climate action reduces cost of emission control, improves health)
- Patrick Hanlon (Minneapolis Health Policy for Rooftop Solar)
- Sherrie Gruder (Dane County Climate Action Plan)

Public Acceptance and Action Track: Solar Commons Forum

9:30am - 10:30am

Wright Suite

Moderator: Kathryn Milun

The Rocky Mountain Institute has analyzed the Solar Commons' financial model and scalability potential

and found it could quickly put 10 gigawatts of solar energy into the US grid and millions of dollars into much needed programs in low-income communities. This forum will explain how the Solar Commons community trust ownership model works and will showcase the work of university students solving the problem of communicating—through public art and internet apps—to their 21st century peers why and how solar energy can scale quickly and equitably using the Solar Commons model.

Dorsey Kaufmann, Ellen McMahon, Karlito Miller Espinosa, Micha Brady, Ryan Raskob, Tommy Duff

Public Acceptance and Action Track: Communicating Climate Action Forum

10:45am - 12:15pm

AiRE Ballroom

Moderator: Paul Imbertson

The public has limited understanding of the grid and the role of renewables and storage in the energy transition. Overwhelming climate change stories are increasing, and need increasing balance with solutions-focused communication that motivate, instead of shut people down. Public education, support, and actions are of strategic importance as part of a rapid shift away from fossil fuels. A network of academic and industry partners involved in a college course on this topic, will each bring different perspectives to the need and challenge of public communication in the energy transition and will engage the audience experience into the conversation.

Aaron Hanson, Allison Chang, Jonee Brigham

Technical Track: Electrification of Transportation Forum: Market Transformation Vectors for Cities, Businesses, Industry

10:45am - 12:15pm

Wright Suite

Moderator: Brian Ross

This session describes four successful market transformation initiatives to promote EV sales, expand charging networks, and create market pathways to broad deployment of solar charging of EVs. The transportation sector is the largest emitter of GHGs, and the electrification of the light-duty fleet is the most significant strategy for decarbonization. But the business case remains weak for developing the needed charging networks to support expanded EV markets, and limited technologies and rate structures are available for charging with renewable energy and expanding solar deployment.

Diana McKeown, Katelyn Bocklun

Policy Track: Solar Homes

10:45am - 12:15pm

Runway Rooms 2-4

Moderator: Dara Bortman



Investment in residential solar would accelerate if the benefits were better understood and consistently valued by solar installers, real estate agents, home buyers, and appraisers. Agents and appraisers across the country are undervaluing homes with solar, and sometimes, steering their clients away from these homes. Solar installers don't understand the processes involved in selling a home or how additional value for solar is achieved. By educating both the solar and real estate industries on these methods, homeowners will feel more comfortable with the benefits of solar – the lower energy costs and the real estate assets.

- Pamela Brookstein (Solar Homes Market Value)
- Robin LeBaron (Solar Home Benefits)
- Janelle McGill (Improving Solar Home Education)

Women in Solar Energy (WISE) Luncheon

(tickets available)

12:15pm - 1:45pm

AiRE Ballroom

Moderator: Marlene Brown

This forum/luncheon was created to promote women who are working in all aspects of solar, and to encourage more women to get involved. The purpose of the forum is to inspire women to become more technically involved in solar, not just peripheral to it. It's easy for us to talk about what we do, but this isn't a forum to talk about our jobs, but about how we got where we are and the obstacles and barriers that we've come up against and broke through or just moved out of the way to continue on our path. This is a forum for accomplished women to share lessons learned and heartfelt stories about their lives. It is the story about the journey that is interesting, powerful and inspiring, especially for women just getting started, but also for the larger audience

- Kathryn Milun
- Lisa Daniels
- Mallory Lindgren

Technical Track: Transportation

1:45pm - 3:15pm

AiRE Ballroom

Moderator: Alan Wernke

Learn more about these four solutions to electrify mobility: What is new with electric bikes? The big 18 wheelers are changing to an electric drivetrain, how will the marketplace put them to work? How do we convert roadside rest stops across America to be powered by

solar? What is the latest Electric cars news?

- Dave Erb (Residential PV with EV)
- Bob McCallister (PV at Rest tops)
- Appalachian State E-Bike Program
- Brad and Brittany Stolt (Stolt Trucking)

Policy Track: Solar Buildings and Community Solar

1:45pm - 3:15pm

Runway Rooms 2-4

Moderator: Laura Cina



Learn about four new and innovative approaches to solving some of the many barriers to financing and building solar from the people who have diligently researched and wrote papers on the issues.

- Isaac Gandler (Building Integrated PV)
- Shannon Carleton (Building Integrated PV)
- Vicki O'Day (MN Community Solar for LIHEAP)

Public Acceptance and Action Track: Personal Climate Actions

1:45pm - 3:15pm

Wright Suite

Moderator: Kaycee Chang

How many people does it take to start change? Just one. Our individual actions make a difference. Personal changes represent a movement to combat climate change. Come to this session to learn about sustaining personal climate actions, the power of small numbers, and a carbon-free future.

- Marion Biddle (Philadelphia Residential Solar Case Studies)
- Anthony Robinson (Home Waste Reduction)
- David Hrvnak (Embracing Residential Renewables) & (Residential PV and EV Combination)

Maximizing Value of Climate Actions Forum

3:30pm - 5:00pm

AiRE Ballroom

Moderator: Ted Redmond

Do you have the drive and technological expertise to develop a solar project, but not the money to pay for it? Are you always on the look-out for new ways to finance your solar developments? If so, this panel is right for you. Experts in securities law, corporate financing, and blockchain technology will help attendees better understand how to utilize opportunity zone financing, crowdfunding, crowdequity, tax credits, and innovative technology to more effectively and efficiently raise money for their solar projects.

Brian Edstrom, David Duccini, David Peteler, Matt Doyle

Wednesday, August 7 (cont.)

Policy Track: Climate Action through Community Solar Forum

3:30pm - 5:00pm
Wright Suite
Moderators: Eric Pasi, Gabriel Chan & Gilbert Michaud

As decarbonization is increasingly framed as an intersectional issue, considering equity may be required for rapid climate action. Community solar can play a unique role as a means to expand access to clean energy to low-income households, renters, and other otherwise excluded groups. Based on the Minnesota experience, this panel will explore key questions confronted by community solar programs at scale concerning the long-term viability of third-party solar development, opportunities to create a more equitable distribution of costs and benefits of clean energy, grid impacts of distributed energy, and the political durability of policies that can support rapid decarbonization.

Minneapolis Queen Cruise (tickets available)

5:15pm - 10:00pm

Meet at Hotel front desk/lobby to board Jefferson Lines bus by 5:25 to Bohemian Flats Park where we will board the Minneapolis Queen Cruise ride down the Mississippi! Join us for dinner and dancing!

Thursday, August 8, 2019

Climate Action Quick Shots (~switch)

9:00am - 10:00am
AiRE Ballroom
Moderator: Sarah Townes

Adyashanti wisely said: In any discipline it is the fundamentals that matter. In our Quick Shot ~switch Session 5 dynamic speakers will speak for just 5 minutes each, and in that short time convey to us the very essence of what they are doing in the world to help bring about the renewable energy revolution, and what inspiration they would convey for the rest of us to do our best work as well. Come join us to catch a concentrated dose of their momentum, humor & wisdom. Be prepared to participate, as ~switch is all about connection!

- Carra Cheslin (National Solar Tour)
- Dave Finnigan (Climate Action Begins at Home)
- Kaycee Chang (ASES Student Chapters)
- Jonee Brigham (U. of Minn Compelling Climate Action)
- Brett Weal (Opportunity Zone Financing)

Conference Highlights and Call to Action

10:00am - 10:40am
AiRE Ballroom
Moderator: John Dunlop

Charged up for Action: UN Climate Conference

11:05am - 11:40am
AiRE Ballroom
Moderator: Carly Rixham

Ellen Anderson, Director of the University of Minnesota's Energy Transition Lab and former state Senator, will weave together the conference themes into a closing call to action. She will provide some examples that illustrate reasons for hope. She will highlight the need for ambitious goals and measurable progress from the local to the global level, and the importance of what happens next - after the conference, including the UN Climate Summit.

Ellen Anderson

ASES Annual Membership Meeting & Lunch

12:00pm - 1:30pm
AiRE Ballroom

The American Solar Energy Society invites its members to join us at the National Solar Conference to cover new and exciting projects, goals, and financial reports.

- Carly Rixham (ASES Vision and Programs)
- Carly Cipolla (Webinars, ASES Chapters)
- Eva Coringrato (ASES Membership)
- Heddie Hall (ASES Tiny Watts)
- Elaine Hebert, Sarah Townes (Finance Report)

NABCEP Introduction to Solar Advisory Model (SAM) (PV 430) (seats available)

12:00pm - 4:00pm
Wright Suite

This four-hour intermediate-to-advanced level course uses a combination of presentations and practice exercises to introduce students to System Advisor Model (SAM). SAM is a free software for techno-economic modeling of renewable energy projects provided by the U.S. Department of Energy National Renewable Energy Laboratory (NREL) and is used by project developers, system designers, researchers, and others involved in making technical and financial decisions about renewable energy projects. Course participants will work through examples of a residential/commercial rooftop photovoltaic system and cover assumptions for system design, retail electricity rates, and building loads, to analyze model results such as performance ratio, net present value (NPV), and payback period.

Electric Bus Tour of City of Minneapolis Solar Projects (tickets available)

1:30pm - 4:30pm
Meet: hotel front desk / lobby
Tour of projects include: Minneapolis Convention Center, Heywood Garage, Shiloh Temple



NABCEP Battery-Based PV System Design (PV 230) (seats available)

4:30pm - 8:30pm Wright Suite
Instructor: Kris Schmid, Legacy Solar

This four-hour course uses a combination of presentations, exercises, and classroom discussions to cover battery-based PV system components, from modules and array configurations to batteries, charge controllers, and inverters. Participants will review design principles for sizing battery-based PV systems, beginning with a thorough analysis of daily loads. Based on those load requirements, choices for system voltage and amp-hour capacity of the battery bank will be discussed and determined. Finally, participants will select appropriate system components and configure them to complete the stand-alone PV system.

Electric Bus Pub Crawl of Solar-Powered Microbreweries (tickets available)

5:30pm - 8:30pm
Meet: hotel front desk / lobby
Insight Brewing & Taproom, Able Seedhouse and Brewery, Utepils Brewing

Friday, August 9, 2019

NABCEP PV Sales & Finance (PV 203) (seats available)

9:00am - 5:00pm Wright Suite
Instructor: Jack Kluempke

This eight-hour course uses a combination of presentations and online resources to demonstrate a cost/benefit analysis of a PV system. Using PV system installation and operating costs, incentives, utility rate structures, course participants will explore various methods used to calculate return on investment for a PV system based on customer consumption and expected system production.

Schedule subject to change. Visit ases.org/conference/ program for more details and up to date information.

Posters

Posters will be on display Tuesday-Thursday and will be featured during the Poster Session: Tuesday, August 6, 2019 3:15pm -5pm

Changyeol Yun, Research Scientist
Analysis of Photovoltaic Market Potential in Korea to Set the National Supply Target

Dr. John Martin, Handy Village Institute
Small Wind Coops

Ifeanyi Okonkwo, University of Nigeria, Nsukka
Development and Performance Evaluation of Energy Desalination System in Nigeria

Kayla Carey, Colorado Chautauqua Association
Electrified District Cooling at a National Historic Landmark

Lester Shen, Lawrence Berkeley National Laboratory
Making Better Use of On-site PV Generation: Direct Distribution of DC Power in Buildings

Malshana Wadugurunnehalage, University of California, Fresno
Critical Importance of EV Battery Standardizing and Battery Switching Stations

Natalie Mann, The University of Alabama in Huntsville
Investigation of Methyl Ammonium Lead Halide Perovskite Solar Cells

Nathan Edmunds, West Chester University
Building a 100% Renewable Energy Grid for America

Omer Elsanusi, Southern Illinois University Carbondale
Thermal Energy Storage System with Multiple Families of Phase Change Material

Patrick Hamilton, Science Museum of Minnesota
Science Museums and Centers Should Champion Energy Innovation and Climate Change Engagement

Paul Imbertson, University of Minnesota
Power Futures: Student Story Maps for Public Power Systems Education

William Heegaard, Footprint
Renewable Disaster Recovery - How To Build Back Better



48th Annual National Solar Conference



MINNEAPOLIS, MN
August 5-9
#SOLAR2019TwinCities

The following sessions/
workshops are eligible for
American Institute of Architects
continuing education units:

Tuesday:

Keynote: Aggressive Climate
Action – Leadership from
International to Local

Wednesday:

Policy Track: Climate Action and Public Health
Policy Track: Solar Homes
Policy Track: Solar Buildings and Community Solar

Thursday:

Electric Bus Tour of City of Minneapolis Solar Projects



ASES SOLAR 2019 Notes

2019 ASES AWARD WINNERS AND FELLOWS

Join us 6pm Tuesday evening in the Aire Ballroom for the Annual Awards Banquet and Auction (tickets available)

WOMEN IN SOLAR ENERGY AWARD
presented to
Dr. Gay Canough

JOHN AND BARBARA YELLOTT AWARD
presented to
Paulo Henrique Soares

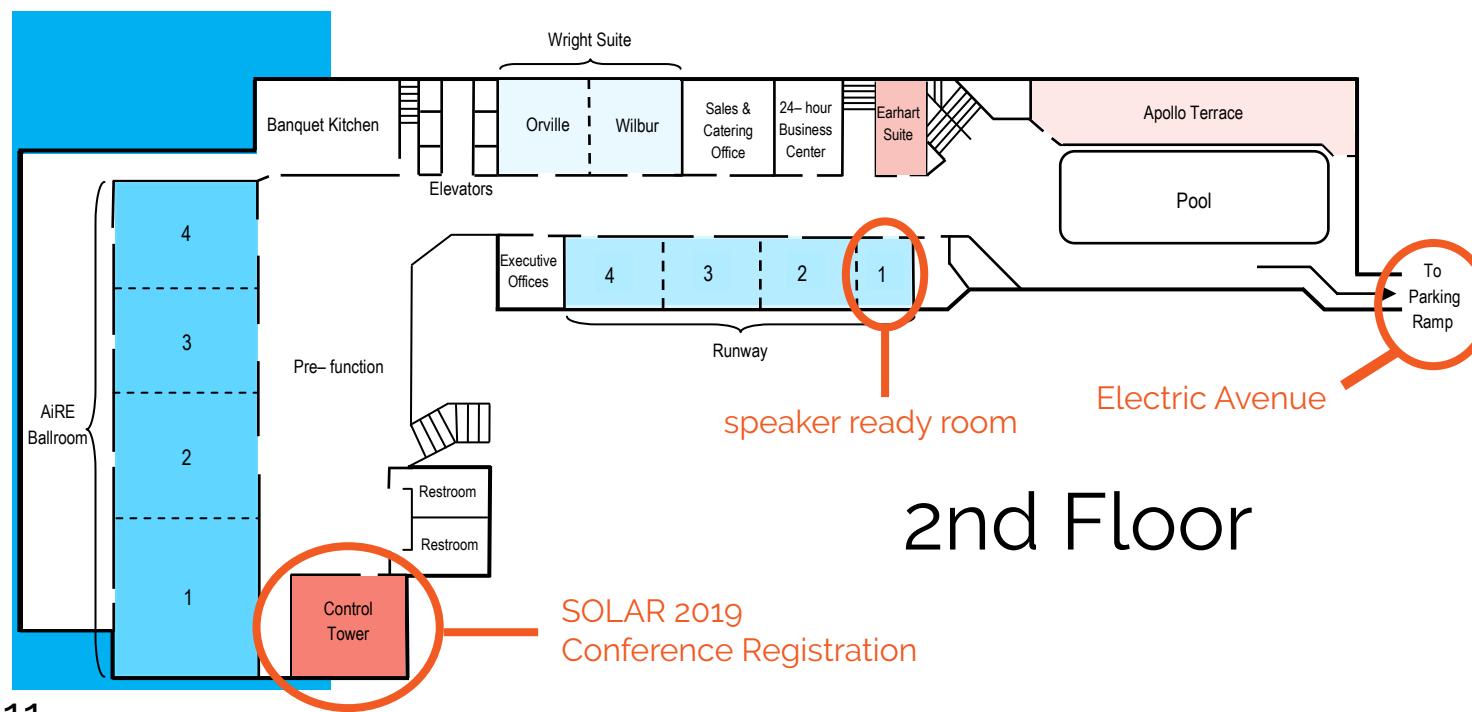
REBECCA VORIES AWARD
presented to
Doug Shoemaker

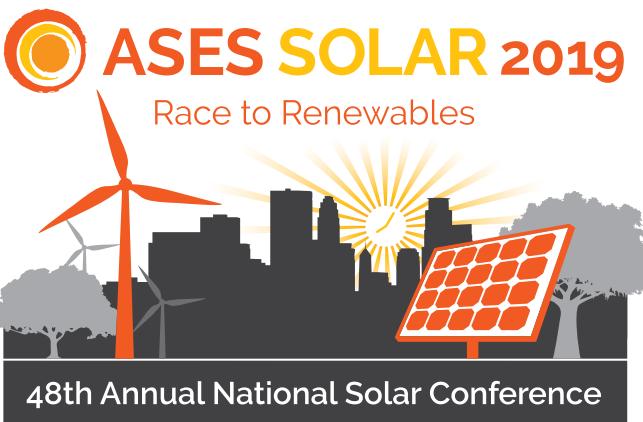
PASSIVE PIONEER AWARD
presented to
David Panich

CHARLES GREELEY ABBOT AWARD
presented to
Dr. Charlie Gay

2019 ASES Fellows Inductees:
Jill Cliburn
John Dunlop

Crowne Plaza AiRE, 3 Appletree Square, Bloomington, Minnesota, 55425





AMERICAN
SOLAR
ENERGY SOCIETY
MINNEAPOLIS, MN
August 5–9
#SOLAR2019TwinCities

More Notes...

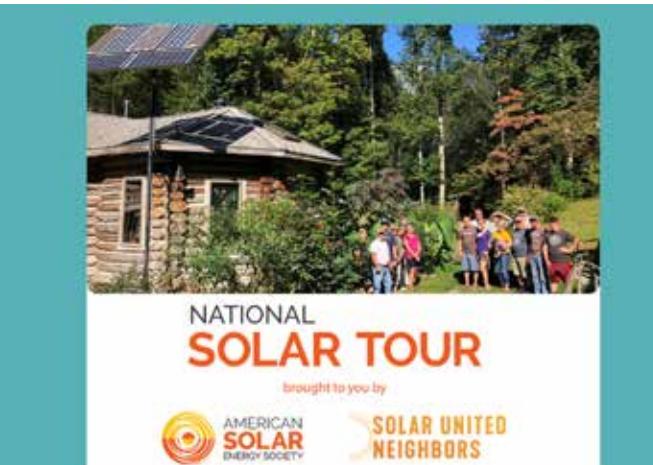
Thank You SOLAR 2019 Sponsors



Exhibitors:

National Solar Tour / SUN
ASES Tiny Watts
Clean Energy Credit Union
Solaria

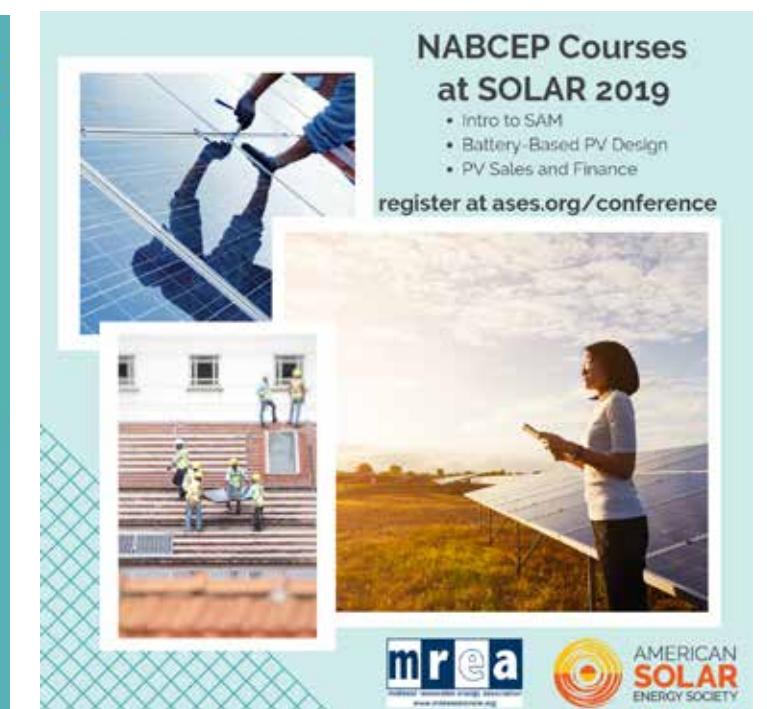
Sarah Grace Photography
Xcel Energy
Acheulean Consulting
Minn. Renewable Energy Society



October 5-6, 2019

Sign-up now:
nationalsolartour.org/localtours

Contact us:
solartour@ases.org
solartour@solarunitedneighbors.org





AMERICAN
SOLAR
ENERGY SOCIETY



ASES SOLAR 2020

June 23-26, 2020 | George Washington University | Washington D.C.

