

Agenda

Presented by Jeff Gilbert

An Overview of Solar Photovoltaics (PV)

- Introduction
- Solar PV industry trends and stats
- The nature of PV (IV curves, temperature, irradiance and efficiency)
- PV project economics, cost trends and ownership models

PV System Predesign Considerations

- National and international standards for PV
- The National Electric Code (NEC)
- Certifications, training and qualifications (NABCEP, NETA, Safety, Master Electrician)
- Safety

PV System Design

- System performance modeling and modeling software
- Inverter topographies and capabilities
- Common system configurations (including series and parallel wiring)
- Solar array mounting methods and the pros and cons of each
- String sizing
- Methods of grid interconnection

Project Implementation

- Permitting and interconnection
- Utility interconnection agreements
- PV system grounding
- Construction and project management

System Commissioning (CX)

- PV plant commissioning timeline
- Pre-energization testing
- Post-energization testing
- Performance verification
- Most common CX related failures

Operation and Maintenance (O&M)

- Performance monitoring
- Inspection checklists
- Electrical testing and thermography
- Common and not-so-common maintenance issues

Important Ingredients for a Successful Solar PV Project: Best Practices and Lessons Learned
Columbia, MD - Thursday, February 27, 2020

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Learning Objectives

You'll be able to:

Discuss basic principles of solar photovoltaic (PV) technology with potential project owners.

Understand solar PV economics, cost trends and ownership models.

Comply with applicable codes and standards, including the National Electrical Code.

Describe solar PV system components and consider system configurations and mounting methods.

Discuss PV project implementation, including permitting and interconnection.

Explain the commissioning process which insures that a PV system is properly designed, installed, tested and performing as specified.



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Discuss photovoltaic (PV) project economics, cost trends and ownership models

Comply with National Electrical Code requirements

Explore solar PV system configurations and array mounting methods

Learn about utility interconnection agreements

Verify performance through system commissioning

Gain practical tips on common and not-so common PV maintenance issues

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6.5 PDHs

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Jeff Gilbert *Owner, President of Azimuth Solar LLC*

Mr. Gilbert brings over 24 years of experience in the renewable energy industry and holds a B.S. degree in Mechanical Engineering. He provides solar energy consulting, training and inspection services within the solar energy and real estate industries. Under Azimuth Solar, in 2018 Mr. Gilbert was contracted by the Electric Power Research Institute (EPRI) to write a report entitled *Solar Photovoltaic (PV) Plant Commissioning Best Practices*. From 2013 to 2016 he served as director of operations and maintenance (O&M) for Vigilant Energy Management, overseeing a portfolio of over 100 commercial PV systems. In 2000 Mr. Gilbert co-founded Chesapeake Solar, a leading mid-Atlantic solar energy company. In 2008 his company was listed on Inc. Magazine’s 500 fastest-growing small companies, and later that same year the company was acquired by groSolar, one of the nation’s leading solar energy companies at the time. He served on the board of directors for the local chapter of the Solar Energy Industries Association (MDV-SEIA) and was chair of the Potomac Region Solar Energy Association (PRSEA) for four years starting in 1998. Mr. Gilbert has been certified by the North American Board of Certified Energy Practitioners (NABCEP) for both thermal and photovoltaic systems.

Seminar Information

Sheraton Columbia Town Center Hotel
10207 Wincopin Circle
Columbia, MD 21044
(410) 730-3900

Tuition
\$289 for individual registration
\$269 for three or more registrations.
Included with your registration: Complimentary continental breakfast and printed seminar manual.

Receive a reduced tuition rate of \$101 by registering to be our on-site coordinator for the day. For availability and job description, please visit www.halfmoonseminars.org.

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar or the self-study package. You may also send another person to take your place.

Continuing Education Credit Information

This seminar is open to the public and offers 6.5 PDHs to professional engineers in all states. HalfMoon Education is an approved continuing education provider for Maryland engineers.

This course offers 6.5 HSW LUs/continuing education hours to architects in all states. Courses approved by the American Institute of Architects are accepted in Maryland.

The American Institute of Architects Continuing Education System has approved this seminar for 6.5 LU|HSW (Sponsor number J885). Only full attendance is reportable to the AIA/CES. Visit www.halfmoonseminars.org to view complete AIA/CES information under this course listing.

HalfMoon Education is an approved continuing education sponsor for engineers in Florida, Indiana (License No. CE21700059), Maryland, New Jersey (Approval No. 24GP00000700), North Carolina, and North Dakota. HalfMoon Education is deemed an approved continuing education sponsor for New York engineers and architects. (Regulations of the Commissioner §68.14(i)(2) and §69.6(i)(2)).

This course offers a non-credit continuing education opportunity to construction contractors. It has not been approved by any state contractor licensing entity for continuing education credit.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Additional Learning

- Webinar Series**
- Demolition and Deconstruction**
- **Purposes and Benefits of Demolition and Deconstruction**
Wed., Jan. 15, 2020, 11:00 AM - 1:00 PM CST
 - **Markets/Uses for Deconstructed Materials**
Wed., Jan. 15, 2020, 1:30 - 3:00 PM CST
 - **Material-Specific Deconstruction Methods**
Thurs., Jan. 16, 2020, 11:00 AM - 12:30 PM CST
 - **Planning and Conducting a Deconstruction**
Thurs., Jan. 16, 2020, 1:00 - 3:00 PM CST

- Ethical Issues for Engineers**
- **Handling Ethical Issues in Professional Engineering Practice**
Fri., Jan. 17, 2020, 12:00 - 2:00 PM CST
 - **Resolving Disputes and Handling Ethical Issues in Government Projects**
Fri., Jan. 31, 2020, 12:00 - 1:00 PM CST
 - **Complying with Rules of Professional Conduct**
Fri., Feb. 14, 2020, 12:00 - 1:00 PM CST

- Off-Grid Master Class**
- **Part I**
Wed., Jan. 22, 2020, 11:00 AM - 2:15 PM CST
 - **Part II**
Thurs., Jan. 23, 2020, 11:00 AM - 2:15 PM CST

- Aerial Mapping Technologies and Procedures**
- **Overview of Aerial Mapping Technologies and Platforms**
Thurs., Jan. 23, 2020, 11:00 AM - 12:30 PM CST
 - **Mapping Using UAS and Photogrammetry**
Thurs., Jan. 23, 2020, 1:00 - 3:00 PM CST
 - **Post Processing Software Applications and Photogrammetry Demonstration**
Fri., Jan. 24, 2020, 11:00 AM - 1:00 PM CST
 - **FAA Commercial UAS Regulations and FAA Part 107**
Fri., Jan. 24, 2020, 1:30 - 3:00 PM CST

For more information and other online learning opportunities visit:
www.halfmoonseminars.org/webinars/

Can’t Attend? Order the Manual and Audio from the Live Seminar as a Self-Study Package!

Audio recordings of this seminar are available for purchase starting at \$269. See registration panel for more information and please refer to specific state licensing rules or certification requirements to determine if this learning method is eligible for continuing education credit.

Registration

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How to Register		Registrant Information
Online: www.halfmoonseminars.org		
Phone: 715-835-5900		
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Complete the entire form. Attach duplicates if necessary.		
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		Email address is required for credit card receipt, program changes, and notification of upcoming seminars and products. Your email will not be sold or transferred.
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Tuition	
() I will be attending the live seminar. Single Registrant - \$289.00 . Three or more registrants from the same company registering at the same time - \$269.00 each.	
() I am not attending. Please send me the self-study package:	
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☐ CD/Manual Package for \$289.00 . ☐ USB/Manual Package \$289.00 .	
(S&H included. Please allow five weeks from seminar date for delivery)	
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