RENEWABLE ENERGY 101

September 26-27, 2019
EUCI Office Building Conference Center
Denver, CO

“Renewables 101 is a very well thought-out and delivered course for basic understanding of the renewable energy market. The course covers a wide range of topics from technologies to system integration, to market forecast and opportunities. The instructor, Paul Komor, is a recognized expert who provides an interactive course that informs and challenges the attendees.”

Contracts Analyst Principal, American Electric Power (AEP)
OVERVIEW

Renewable energy is growing at an astounding pace, and now accounts for more than half of all new electric generating capacity additions. Costs for renewables — notably solar photovoltaics (PV) — have dropped to the point where they can undercut coal and natural gas-fired generation. And further cost reductions are expected for wind and solar PV, meaning that these technologies will continue to see very rapid growth.

Renewables' growth is challenging many of the assumptions upon which traditional utility planning and operation relies. Renewables are creating countless new business opportunities and disrupting many of the existing companies and institutions that make up the electricity grid.

This course provides a thorough primer on renewables. It delivers insight into the technologies themselves, focusing on real-world cost and performance. It covers metrics for assessing renewable technologies, and for comparing them to traditional generation. It untangles the complex issue of grid integration, detailing the technical and economic challenges that variable renewables impose on electricity grid operation. And it offers a pragmatic guide to the various state and federal policies that both help and hinder renewables.

RECOMMENDED MATERIALS

To participate in class exercises, a laptop computer with internet connection capability is required.

LEARNING OUTCOMES

- Discuss the electric industry, its key concepts, and the growing role of renewable generation in it
- Review statistics on renewable market growth and projected future
- Evaluate cost, performance, and technical characteristics of renewable energy technologies, including:
  - Wind
  - Solar — both photovoltaic (utility scale and distributed) and concentrating solar
  - Hydro power
  - Geothermal power
  - Biomass
- Examine impacts of wind and solar generation on the electric grid
- Review best practices for integrating renewable electricity on the grid
- Analyze the ever-changing policy environment and its impacts on renewables
- Identify opportunities, risks, and how to move forward for renewable business success

“Professional, stimulating and educational – all I could ask for in a renewable seminar!”

Energy Services Coordinator, City of Ames Electric

“The course surpassed my expectations – a lot of very pertinent data was covered over a very short time. This is a great course for anyone who wants to learn more about the electric industry including power risks and opportunities.”

Senior Technical Advisor, EPRI
WHAT PAST ATTENDEES HAVE SAID

“Great quality of information, current. Presenter is an industry expert.”

Energy Utility Engineer, Department of Enterprise Services

“Good for basic renewable energy information.”

Project Manager, Renewable Energy, Energy Trust of Oregon

“Paul Komor is very knowledgeable and explains complex materials very well for non-technical attendees. I learned a lot. There is a lot of material in a short amount of time.”

Regulatory Manager, ENMAX Corporation

“Very thorough presentation on renewable energy markets and energy usage of the future.”

Regulatory Manager, ENMAX Corporation

“All very informative and good speakers. Each speaker was able to address all questions. Learned a lot!”

Energy Engineer, State of Washington

“Enjoyed seminar very much. Thank you.”

Power Contract Specialist, Sacramento Municipal Utility District (SMUD)

“Wonderful training. Thank you!”

National Siting Lead, ENERCON
AGENDA

THURSDAY, SEPTEMBER 26, 2019

12:45 – 1:15 pm  Registration
1:15 – 5:15 pm  Course Timing

I.  The Big Picture: Renewable Energy Technologies & Their Growing Role on the Electric Grid

• Electricity systems: Introduction and overview
• Electricity units and measures: The fundamentals
• Trends and shifts in electricity markets: Drivers for change
• Cost metrics for electricity generation

II.  Renewable Energy Technologies: Cost and Performance

• Technical fundamentals: How they work
• The renewable energy resource: where and how much
• Understanding renewables’ potentials, limitations, and promising applications
• Costs and performance: Current status and projections
• Technologies covered include:
  o Wind
  o Solar
    - Photovoltaic (PV) – utility scale and distributed
    - Concentrating Solar
  o Hydro power
  o Geothermal Power
  o Biomass

FRIDAY, SEPTEMBER 27, 2019

7:30 – 8:00 am  Continental Breakfast
8:00 – 5:00 pm  Course Timing
12:00 – 1:00 pm  Group Luncheon

III.  Grid Integration

What is grid integration, and why does it matter?
• Solar PV and wind variability
• How much variable renewable energy can power systems handle?
  o Technological and economic limits
  o Case studies: Denmark, US, CAISO
• Options to increase system flexibility
  o System operation
  o Load Management/DSM
  o Electricity pricing
  o Flexible generation
  o Storage
• Best planning practices to accommodate variable renewables while maintaining system reliability

“As someone with virtually no background in the energy industry, this course was able to break down the mechanics and applications of renewables. Very helpful for anyone with interest in joining the renewable energy industry.”

General Manager, Energy Consulting
IV. The Ever-Changing Policy Environment

- Understanding the policy landscape to leverage renewable business
- How policy helps (and hinders) new renewables
- Federal policy drivers
  - Tax Credits – ITC and PTC
- State and local policy drivers
  - State goals and procurement policies, including RECs
  - Renewable portfolio standards (RPSs)
  - Utility programs and policies
  - Net metering

V. Putting it all Together: Tips for Renewables Success

- Renewable market projections
- Market disruptions
- Tools, data, and software for renewable technology analysis
- Opportunities and risks: How to move forward

COURSE INSTRUCTOR

Paul Komor
Founder of Energy Education Programs, Renewable and Sustainable Energy Institute (RASEI)

Paul Komor teaches graduate courses in energy technology and policy at the University of Colorado-Boulder, and is an Advisor to the International Renewable Energy Agency (IRENA) and UTP (Malaysia). Prior to joining the University of Colorado faculty, Paul was a Project Director at the U.S. Congress’ Office of Technology Assessment (OTA), where he worked with House and Senate Congressional Committees in preparing and evaluating energy legislation. Prior to joining OTA, he taught at Princeton University. He has published numerous refereed articles, reports, and other papers on renewable energy. His book, Renewable Energy Policy, was required or recommended reading for courses at University of California, Santa Barbara (UCSB), University of Denver (DU), University of Utah, Robert Gordon University (UK), and elsewhere. Paul was selected as the MAP/Ming Visiting Professor of Energy and the Environment by Stanford University, where he spent a sabbatical year researching and teaching on renewable energy policy and technology. In 2007, Paul shared in the Nobel Peace Prize awarded to Al Gore and the Intergovernmental Panel on Climate Change (IPCC) “for their efforts to build up and disseminate greater knowledge about man-made climate change”. For his work with the IPCC, Paul was named a contributor to the Nobel Peace Prize. Paul holds a BS in Engineering from Cornell University, and MS and PhD degrees in Engineering from Stanford University.

“Paul did a great job. I heard many positive comments from the audience. Great interaction.”

Director of Energy, CH Robinson
INSTRUCTIONAL METHODS

Case studies and PowerPoint presentations will be used in this program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the course to be eligible for continuing education credit.

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this course may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.2 CEUs for this course.

EVENT LOCATION

EUCI Conference Center
4601 DTC Blvd., B-100
Denver, CO 80237

NEARBY HOTELS

Hyatt Regency Denver Tech Center
7800 E. Tufts Ave
Denver, CO 80237
Phone: 303-779-1234
0.3 miles away

Hilton Garden Inn Denver Tech Center
7675 E. Union Ave
Denver, CO 80237
Phone: 303-770-4200
0.6 miles away

Denver Marriott Tech Center
4900 S. Syracuse St
Denver, CO 80237
Phone: 303-779-1100
0.7 miles away

Hyatt Place Denver Tech Center
8300 E. Crescent Parkway
Greenwood Village, CO 80111
Phone: 888-492-8847
0.9 miles away
REGISTRATION INFORMATION

Mail Directly To:
EUCI
4601 DTC Blvd., Ste. 800
Denver, CO 80237
OR, scan and email to: conferences@euci.com
WWW.EUCI.COM
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f: 303-741-0849

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EVENT LOCATION

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4601 DTC Blvd., B-100
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See nearby hotels on page 6

PLEASE SELECT

☐ RENEWABLE ENERGY 101 COURSE
   SEPTEMBER 26-27, 2019: US $1395
   Early bird on or before September 6, 2019: US $1195

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name

Job Title

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What name do you prefer on your name badge?

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CREDIT CARD INFORMATION

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OR Enclosed is a check for $_________________ to cover ________________ registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before September 6, 2019 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800.

EUCI reserves the right to alter this program without prior notice.

ENERGIZE WEEKLY

Energize Weekly is EUCI’s free weekly newsletter, delivered to your inbox every Wednesday. We provide you with the latest industry news as well as in-depth analysis from our own team of experts. Subscribers also receive free downloadable presentations from our past events.

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