

RENEWABLE ENERGY 101

A One Day Virtual "Crash Course" on Renewable Energy

September 29, 2020
Online | Central Time

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“My experience attending EUCI’s Renewable Energy 101 conference remotely went very well. The technology utilized was very user-friendly and allowed me to fully participate in the conference. I’m glad I was able to receive the training & knowledge needed, despite an inability to travel. Would certainly recommend to others!” –

Regulatory Affairs, DTE Energy

EUCI ONLINE COURSE

EUCI is pleased to offer this one-day course on our online interactive platform. Enjoy a valuable learning experience with a smaller impact on your time and at reduced cost. You will gain new knowledge, skills, and hands-on experience in just one day from the comfort of your remote location.



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EUCI is authorized by IACET to offer 0.7 CEUs for the course

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. With projections on further cost reductions and continued industry growth, renewables are challenging many of the assumptions upon which traditional utility planning and operation relies.

This course provides a thorough primer on renewables in the changing marketplace. It delivers insight into the technologies themselves, focusing on real-world cost and performance in the current environment. 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 and constantly evolving policies and market conditions that both help and hinder renewables.

LEARNING OUTCOMES

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

RECOMMENDED MATERIALS

To participate in this E-Learning course, a computer with internet connection and audio capability is required.



“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)

REGISTER TODAY! CALL **303-770-8800** OR VISIT **WWW.EUCI.COM**

WHAT PAST ATTENDEES HAVE SAID

““

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

Energy Services
Coordinator, City of Ames
Electric

““

“I am new to the utility industry and the instructor’s ability to make renewable energy comprehensive, interesting and enjoyable is remarkable.”

Staff Attorney, Connecticut Public Utilities
Regulatory Authority

““

“This course offers a high level overview of renewable energy. It is helpful for all levels of experience and covers a wide variety of related topics. Additionally, attendees of all backgrounds offer different experience and perspectives that bring more knowledge to everyone.”

Staff Accountant,
MAP Energy

“The instructor was very knowledgeable and interesting to listen and learn from”

SVP & CIO, Western Area Power Administration (WAPA)

“Provided good context on which details were more dynamic – how quickly costs and policies are changing”

Energy Analyst, US International Trade Commission

“Wonderful training. Thank you!”

National Siting Lead, ENERCON

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

Regulatory Manager, ENMAX Corporation

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

Energy Utility Engineer, Department of Enterprise Services

““

“Enjoyed seminar very much. Thank you.”

Power Contract Specialist,
Sacramento Municipal
Utility District (SMUD)

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

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AGENDA

TUESDAY, SEPTEMBER 29, 2020 - CENTRAL TIME

- | | |
|--------------------------|----------------------|
| 8:45 – 9:00 am | Log In |
| 9:00 am – 5:15 pm | Course Timing |
| 12:30 – 1:15 pm | Lunch Break |

**The instructor will integrate additional morning and afternoon breaks during the course*

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

Renewable Electricity Technologies

- Technical fundamentals: How they work
- The renewable energy resource: where and how much
- Understanding their 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

III. Grid Integration

- What is grid integration, and why does it matter?
- Solar PV and wind variability
- Technological and economic limits to variable renewable electricity in power systems
- 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

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AGENDA

TUESDAY, SEPTEMBER 29, 2020 - CENTRAL TIME (CONTINUED)

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
 - 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

INSTRUCTOR



Paul Komor

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

Paul Komor is the founder of the Energy Education programs at the Renewable and Sustainable Energy Institute (RASEI) and a lecturer in the Environmental Studies Program at the University of Colorado-Boulder. He currently teaches graduate courses in energy technology and policy at CU-Boulder, and is an Advisor to 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

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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 AN-SI/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 AN-SI/IACET Standard.

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INSTRUCTIONAL METHODS

PowerPoint presentations and open discussion will be used

ONLINE COURSE DELIVERY & PARTICIPATION DETAILS

We will be using Microsoft Teams to facilitate your participation in the upcoming event. You do not need to have an existing Teams account in order to participate in the broadcast – the online course will play in your browser and you will have the option of using a microphone to speak with the room and ask questions, or type any questions in via the chat window and our online administrator will relay your question to the instructor.

- You will receive a meeting invitation which will include a link to join the meeting.
- Separate meeting invitations will be sent for the morning and afternoon sessions of the online course.
 - o You will need to join the appropriate meeting at the appropriate time.
- If you are using a microphone, please ensure that it is muted until such time as you need to ask a question.
- The remote meeting connection will be open approximately 30 minutes before the start of the online course. We encourage you to connect as early as possible in case you experience any unforeseen problems.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

You must be logged in for the entire presentation and send in the evaluation after the online course is completed.



“I was skeptical about the remote learning platform but in fact i found this to be more efficient and overall better than an in person class!!! it was nice to be able to type questions out and have them answered at a good point in the discussion instead of derailing the presentation.”

Deputy Director, City of Naperville

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REGISTRATION INFORMATION

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RENEWABLE ENERGY 101 ONLINE COURSE
SEPTEMBER 29, 2020: US \$795 (Single Connection)

PACK OF 5 CONNECTIONS: US \$3,575

PACK OF 10 CONNECTIONS: US \$5,965

For volume discounts call +1.303.770.8800 for quote

**all other discounts do not apply to license packs*

Online Course Delivery & Participation Details

See page 6 for information

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

Print Name

Job Title

Company

Address

City

State/Province

Zip/Postal Code

Country

Phone

Email

CREDIT CARD INFORMATION

Name on Card

Billing Address

Account Number

Billing City

Billing State

Exp. Date

Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

Billing Zip Code/Postal Code

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 August 7, 2020 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.

