

# Agenda

*Presented by Andrew Larkin*

## Understanding the Environmental and Economic Benefits of Cogeneration

- Separate heat and power vs. cogeneration
- History of cogeneration in Europe and the United States
- Environmental benefits of cogeneration
- Economics of CHP
- Science of cogeneration and its fit with renewable energy

## Laws, Regulations and Building Codes Impacting Cogeneration

- Federal, state and local environmental regulations
- Utility regulations
- Permitting process
- Building code considerations
- Impact on LEED and other sustainable certifications

## Considering Cogeneration Technologies

Gas turbines	Steam turbines
Microturbines	Reciprocating engines
Fuel cells	Biomass and other applications

## Resolving Impediments to Cogeneration

- Utility treatment of cogeneration
- Interconnection considerations
- Limitations of available technologies
- Capital costs and financing

## Making the Move to Cogeneration: Analysis, Modeling and Case Studies

- Understanding existing pre-cogeneration conditions
- Performing load analysis
- Selecting a prime mover
- Modeling performance
- Financial modeling
  - Capital costs
  - Operation and maintenance expense
  - Return on investment, lifecycle analysis
  - Financial incentives
- Analyzing public and private case studies

**Cogeneration System Principles and Practices**  
*Understanding Cogeneration Today and Its Fit in a Growing Renewable Energy World*  
Baltimore, MD - Friday, June 14, 2019



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Altoona, WI 54720-0278

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## Learning Objectives

**You'll be able to:**

**Examine** the fundamental principles and benefits of combined heat and power.

**Identify** the laws, regulations and building codes impacting cogeneration.

**Understand** the technologies behind cogeneration, including microturbines and reciprocating engines.

**Evaluate** operation and maintenance expenses associated with combined heat and power systems.

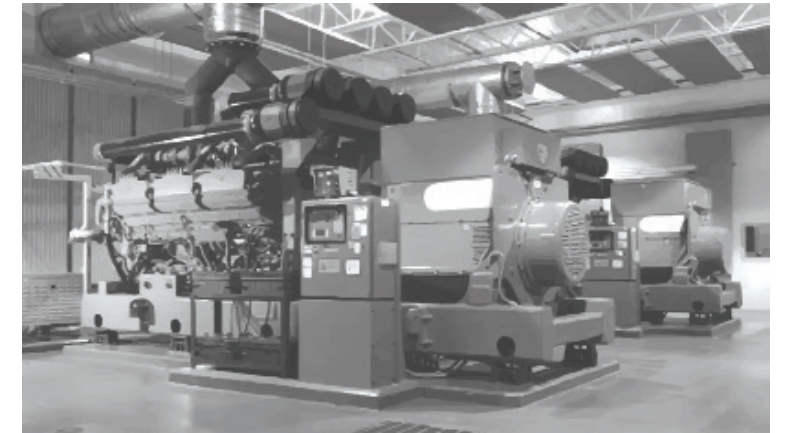
**Analyze** public and private cogeneration case studies.



# Cogeneration System Principles and Practices

*Understanding Cogeneration Today and Its Fit in a Growing Renewable Energy World*

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**Understand** the economic and environmental benefits of cogeneration

**Review** building code considerations and the permitting process

**Discuss** the impact of LEED and other sustainable certifications

**Learn** about gas turbines, fuel cells and other cogeneration technologies

**Explore** capital costs and financial incentives associated with cogeneration

## Continuing Education Credits

### Professional Engineers

6.5 PDHs

### Architects

6.5 HSW LUs/CE Hours

6.5 AIA HSW Learning Units

### Contractors

Non-Credit Continuing Ed.



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# Faculty

**Andrew Larkin** *VP, Development Engineering at DCO Energy, LLC*

Mr. Larkin is Vice President of Development Engineering at DCO Energy based in New Jersey. He is responsible for technical solutions to energy project opportunities, including simple cycle and combined cycle cogeneration plants, central heating and cooling facilities, renewable energy projects, and others. He also has managed the engineering of several energy projects from development through start up, commissioning and performance testing. Mr. Larkin earned his B.A. degree in English from Franklin and Marshall College, B.S.M.E. degree and M.S. degree in Engineering Management from Drexel University, and has been involved in the energy business for over 30 years.

DCO Energy, LLC, is an independent energy company specializing in the development, engineering, procurement, construction, start up, commissioning, operation, maintenance and management, as well as, ownership of central energy centers (CEC), renewable energy projects, combined heat, chilling and power (CHCP) production facilities, and other types of powerplants. DCO was formed in 2000 with a core team of energy experts. Collectively, DCO team members have been independently developing projects or have developed and operated over 400 MW of electric, 400 MMBtu/hr of heat recovery, 1,500 MMBtu/hr of boiler capacity and 130,000 tons of chilled water capacity of energy producing facilities totaling over \$1 billion dollars of assets. DCO provides financing, engineering and design, construction management, startup and commissioning resources, and long-term operating and maintenance services for its own CEC, CHCP and renewable energy projects as well as for third party clients.

## Here’s what past attendees had to say about the program and presenter Andrew Larkin:

“Andy is obviously an expert in this field and has a good command of the topic.” – *Professional Engineer*

“Outstanding presentation.” – *Engineer*

“Very knowledgeable speaker. Shared a ton of information.” – *Architect*

# Seminar Information

## Radisson Hotel at Cross Keys

100 Village Square, 5100 Falls Road  
Baltimore, MD 21210  
(410) 532-6900

Registration  
8:00 - 8:30 am  
Morning Session  
8:30 - 11:45 am  
Lunch (on your own)  
11:45 am - 12:45 pm  
Afternoon Session  
12:45 - 4:30 pm

## Tuition

**\$289** for individual registration  
**\$269** for three or more registrations.

*Each registration includes a 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](http://www.halfmoonseminars.org).

## How to Register

- Visit us online at [www.halfmoonseminars.org](http://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.

**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.

## 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 has approved this seminar for 6.5 HSW Learning Units (Sponsor number J885). Only full attendance can be reported to the AIA/CES.

The New York State Education Department considers courses as approved for New York State mandatory continuing education for professional engineers if the sponsor’s courses are approved by the American Institute of Architects Continuing Education System **and** are in approved subject areas.

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 architects.

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.

# Additional Learning

## Webinar Series

### Erosion and Sediment Control

• **Soils and Causes of Erosion**  
Thurs., May 16, 2019, 11:00 AM - 12:00 PM CDT

• **Goals for Selection of Erosion and Sediment Control Practices**  
Thurs., May 16, 2019, 12:30 - 1:30 PM CDT

• **Calculations for Determining Soil Loss and Channel Stabilization**  
Fri., May 17, 2019, 11:00 AM - 12:00 PM CDT

• **Non-Structural Erosion and Sediment Control Best Practices**  
Fri., May 17, 2019, 12:30 - 1:30 PM CDT

### Septic Systems Series

• **Onsite Wastewater Treatment Technologies, Regulations and Contaminant Removal**  
Tues., May 21, 2019, 11:00 AM - 12:30 PM CDT

• **Evaluating Sites, Setting Treatment Goals and System Design**  
Tues., May 21, 2019, 1:00 - 2:30 PM CDT

• **Alternative and Sustainable Treatment Technologies**  
Thurs., May 23, 2019, 11:00 AM - 12:30 PM CDT

• **Management Programs for Onsite Wastewater Treatment Systems**  
Thurs., May 23, 2019, 1:00 - 2:30 PM CDT

### Construction Cost Estimating

• **Introduction to Cost Estimating**  
Thurs., May 23, 2019, 11:00 AM - 12:30 PM CDT

• **Cost Components – A Closer Look at the Estimates**  
Thurs., May 23, 2019, 1:00 - 3:00 PM CDT

• **Cost Estimate Organization and Examples**  
Fri., May 24, 2019, 11:00 AM - 1:00 PM CDT

• **Cost Estimating Topics**  
Fri., May 24, 2019, 1:30 - 3:00 PM CDT

For more information visit:  
[www.halfmoonseminars.org/webinars/](http://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
<b>Online:</b> <a href="http://www.halfmoonseminars.org">www.halfmoonseminars.org</a>		Name: _____ Company/Firm: _____ Address: _____ City: _____ State: _____ Zip _____ Occupation: _____ Email: _____ Phone: _____
<b>Phone:</b> 715-835-5900		<b>Additional Registrants:</b> Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Fax:</b> 715-835-6066	<b>Code:</b>	Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Mail:</b> HalfMoon Education Inc., PO Box 278, Altoona, WI 54720-0278		Name: _____ Occupation: _____ Email: _____ Phone: _____
<b>Complete the entire form.</b> Attach duplicates if necessary.		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.

( ) I need special accommodations. Please contact me.

Tuition
( ) <b>I will be attending the live seminar.</b> Single Registrant - <b>\$289.00</b> . Three or more registrants from the same company registering at the same time - <b>\$269.00</b> each.
( ) <b>I am not attending.</b> Please send me the self-study package: <input type="checkbox"/> Downloadable MP3 Audio/PDF Manual for <b>\$269.00</b> . <input type="checkbox"/> CD/Manual Package for <b>\$289.00</b> . (Please allow four weeks from seminar date for delivery)
<b>Checks:</b> Make payable to HalfMoon Education Inc.
<b>Credit Card:</b> <i>Mastercard, Visa, American Express, or Discover</i> Credit Card Number: _____ Expiration Date: _____ CVV2 Code: _____ Cardholder Name: _____ Billing Address: _____ City: _____ State: _____ Zip: _____ Signature: _____ Email: _____