

Agenda

Presented by Jay Egg

Applying the Laws of Thermodynamics to Geothermal Heat Pumps and Indoor Thermal Comfort

Applying the laws of thermodynamics to HVAC systems
Understanding the refrigeration cycle
Calculating heating and cooling loads
The effect of air flow and insulation
How comfort is measured
Understanding efficiency

Understanding Earth Loop Systems

The hidden assets of geothermal technologies
Solar Energy in the Earth
Architecture of closed loop systems

- Horizontal ground loops
- Vertical ground loops
- Direct exchange systems
- Thermal load sharing
- Mini-grids

Applications for open loop (Class V Thermal Exchange) systems

- Single well
- Two-well systems

Evaluating topography

Measuring soil conductivity

Environments for ground-loop systems: beneath yards, fields, parking lots, and buildings

Designing Geothermal Systems

Determining loop type Making heat loss calculations
Sizing the unit and the loop
Writing a request for proposal (RFP) and a driller specification
HS2 hydronic design software

Choosing System Type

Distributed GHPs or Chiller Plants
Basic components of geothermal heat pump (GHP) systems:

- Pumps, condenser water piping, heat pump, heat exchanger

Forced air systems Hydronic systems
Domestic hot water options Geothermal swimming pool heaters

Evaluating the Benefits of Geothermal Systems

Incentives to use geothermal Geothermal utilities
Measuring performance Calculating savings and cost
Environmental benefits Tax credits, incentives and rebates
Property Assessed Clean Energy (PACE)
State-based legislation

Maintaining Geothermal Systems

Performing routine maintenance on GHPs

- Loop maintenance (automatic or periodic)
- Pump maintenance/monitoring

Geothermal Heating and Cooling: Technology and Applications

Lexington, KY - Friday, April 17, 2020

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Learning Objectives

You'll be able to:

Apply the laws of thermodynamics to HVAC systems.

Calculate costs and savings of geothermal systems.

Evaluate topography and measure soil conductivity.

Determine loop types, including open loops and vertical and horizontal closed loops.

Choose system components, including pumps, heat exchangers and piping.

Learn about routine maintenance on geothermal systems.

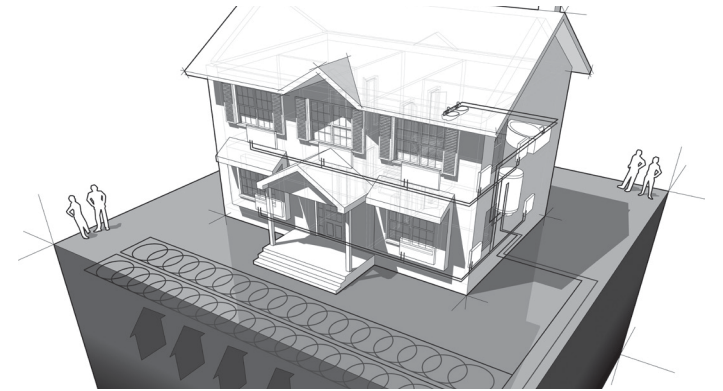


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Geothermal Heating and Cooling: Technology and Applications

Live in-Person Seminar or Live Online Webinar

Lexington, KY - Friday, April 17, 2020



Understand earth loop systems

Identify the environmental and economic benefits of geothermal systems

Learn how to make heat loss calculations

Explore vertical and horizontal closed loop systems

Learn about designing forced air and hydronic systems

Discuss how to maintain geothermal systems

Continuing Education Credits

Professional Engineers

6.5 HSW PDHs

Master & Journeyman

HVAC Licensees

Pending

Architects

6.5 HSW CEHs

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As a result of recent health and safety concerns regarding the COVID-19 virus, this seminar will also be offered as a live webinar (instructions will be sent via email before the date of the webinar). Visit us online at www.halfmoonseminars.org to learn more.



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