

GEOHERMAL HEATING AND COOLING INNOVATIONS: DESIGN, FINANCING AND REGULATION

WORKSHOP

Location: Holiday Inn & Suites - Marlborough
265 Lakeside Ave, Marlborough, MA 01752

Date: Wednesday, October 23, 2013

Time: 8:00 AM to 4:45 PM

Convened by the:

American Ground Water Trust

Concord, NH

501(c)(3) Education Organization



SPONSORS



Preferred Pump

In cooperation with:

Connecticut Geothermal Association
Connecticut Chapter of ASHRAE
HeatSpring Learning Institute
International Ground Source Heat Pump Association

Massachusetts Ground Water Association
New England Geothermal Professional Association
New Hampshire (Granite State) Chapter of ASHRAE
New Hampshire Water Well Association

Continuing Education Credit

ARCHITECT CREDITS – 7.25 LUs (FOR HSW) THRU THE AMERICAN INST. OF ARCHITECTS (PROVIDER #G521)(COURSE #1309)
MA ARCHITECTS – 7.25 CEUs APPROVED AS AIA COURSE PER MA OFFICE OF CONSUMER AFFAIRS & BUSINESS REGULATION
MA ENGINEERS – 7.25 CEUs (ELECTIVE SELF CERTIFICATION) (MA DIVISION OF PROFESSIONAL LICENSURE)
MA HOME INSPECTORS – 6.0 CEUs APPROVED THRU THE MA OFFICE OF CONSUMER AFFAIRS & BUSINESS REGULATION
MA PLANNERS – 7.25 CERTIFICATION MAINTENANCE CREDITS PENDING THRU THE MA CHAPTER OF THE APA
NH ARCHITECTS, ENGINEERS, GEOLOGISTS – 7.25 CEUs (SELF CERTIFICATION, NO PRE-APPROVALS GRANTED BY NH JOINT BD)
IGSHPA ACCREDITED INSTALLERS – 0.75 CEU's
Call for details about other professions - 800-423-7748

WHO SHOULD ATTEND?

This program is geared to potential end-users and to professionals who design, install, inspect, maintain, approve, recommend or regulate geothermal systems. Geothermal is the technology of choice among those considering "green energy" options for commercial or residential installations.

Energy company engineers, architects, planners & conservation commissioners, building code inspectors, environmental health professionals, home inspectors, water well contractors, HVAC professionals, real estate agents, home builders and developers, town officials (Conservation, Zoning, Planning), water testing specialists etc. should not miss this opportunity to get up to speed with this technology

WHAT IT IS ALL ABOUT

Geothermal heating and cooling technology is advancing rapidly as implementation becomes more wide-spread and accepted in the HVAC market. These systems are appropriate to virtually all types of space-conditioning applications, including, office buildings, schools, historic structures, low income housing, hospitals, and ice rinks to name a few examples. This workshop covers new innovations in system design, financing options and regulation that are lowering initial costs and increasing savings during operation.

Workshop Objectives:

- Define the "state of the art" in terms of design options and economic payback
- Explain financing-entity ownership, tax-breaks, incentives and subsidies available for installing geothermal
- Demonstrate the environmental and strategic benefits of the technology
- Explain the importance of proper ground loop installation and groundwater protection
- Explain Net-Zero design and system integration principles
- Illustrate the environmental scalability of GHP HVAC systems to continuously reduce carbon footprint.
- Demonstrate the essential connection between subsurface conditions and system design and operation and how to get the right information
- Describe the special steps and importance of geothermal system commissioning
- Provide an update on state, local and federal regulatory oversight

The program draws on the experience & expertise of industry and agency professionals and will provide a unique opportunity for exchange of information among policy makers involved in energy issues and specialists involved with the design, construction and permitting of ground source geothermal systems for cooling and heating. Geothermal has the potential to become the technology of choice among those considering "green energy" options for commercial or residential installations. This one-day program is an incredible opportunity to learn from experienced professionals who are on the forefront of geothermal innovation. Geothermal will be coming to buildings near you!

Program

7:30am – 8:00 Registration (Coffee and Donuts)

8:00am – 8:40 Resource Sustainability and Geothermal Heating and Cooling Concepts

Garret Graaskamp, PG, AI, Hydrogeologist, American Ground Water Trust, Concord, NH

- Water and Energy – The Sustainability Nexus
- Geothermal Heating and Cooling Fundamentals
- Installations to ensure Groundwater Protection

8:40am – 9:20 Status of the Geothermal Industry

Garret Graaskamp, PG, AI, Hydrogeologist, American Ground Water Trust, Concord, NH

- Geographic distribution of geothermal installations
- Trends in the growth of geothermal applications
- Market potential and market predictions for the geothermal industry
- How the Geothermal industry is organized nationally, regionally and locally

9:20am – 10:05 Thermal Energy Credits and New England's Geothermal HP Industry

Martin Orio, President, New England Geothermal Professional Association and V.P. Business Development, Water Energy Distributors, Hampstead, NH

- The thermal energy landscape in New England
- Massachusetts Senate Bill 1593
 - The path to passage
 - Implementation before September 2014 - Can it be done?
 - Prospects for the geothermal HP market
- NH Senate Bill 218 (signed into law June 2012)
 - One-year on - the impact on the Renewable Portfolio Standard
 - Geothermal generated thermal energy credits – market scope and profit

10:05am – 10:20 Networking Break

10:20am – 11:00 Financing Innovations for Geothermal Installations

David Neale, VP of Marketing and Business Development, EnergyWise Partners LLC, Rochester, NY

- What is a GHP HVAC system financing-entity ownership model?
- System Leasing versus Thermal Purchase Agreements – What's the difference?
- How does the financing-entity method work to increase GHP HVAC system sales?
- How does monitoring enhance system support and warranty?
- Can this model be retrofitted to existing installations?

11:00am to 11:45 More than a "hole in the ground"- Drilling techniques - Logistics and Grout

Jeff Quinn, Account/ Field Representative, Baroid IDP, Nottingham, NH

- Criteria for selecting a drilling contractor for geothermal projects
- Matching the drilling equipment and drilling methods to the geological and site conditions

- Geothermal Design – What geologic data is needed – what is not?
- Installing the vertical loop into the drilled bore – Do's and Don'ts that cost money
- Grouting material properties and options for geothermal projects
- Techniques of grout placement to meet geothermal design specifications

11:45pm – 12:45 Lunch (Provided on-site)

12:45am – 1:25 Hybrid systems - Innovative GHP/GHEX System Design

Gene Slavens, Geothermal Development Manager, ClimateMaster, Oklahoma City, OK

- Advantages of hybrid for summer and winter demands
- Costs and life-cycle benefits
- Tax incentives and cost benefits of hybrid systems
- Case study example of a 750 ton installation
- Design Comparison of GHPs v. Variable Speed compressor Air-to-Air HPs

1:25pm – 2:10 Net-Zero Energy Design Principles

Jeff Harrison, PE, Forensic Building Science Engineer, The Blake Group, Hermon, ME

- How is Net-Zero Energy defined: cost, emissions, site, source.
- Why is Geo-Exchange the best HVAC system choice for a Net-Zero building?
- Design concepts that fully integrate Geo-Exchange with Solar Thermal that approach Net Zero.
- Providing Near Net Zero with the HVAC system, makes using PV to get to Net Zero practical.
- Energy Demand Reduction Strategies and Management Systems

2:10pm – 3:00 Designing Geothermal HVAC Systems - Pump Energy Optimization Using Electronically Commutated Motors in Centrifugal Pumps

John Manning, PE, President, Earth Sensitive Solutions LLC, Auburn, NY

- System Piping Arrangements – Do's and Don'ts
- System Balancing and Important Decisions
- Equipment Selection – HVAC System Type and Integration
- Calculating energy savings using VFD pumps
- Energy Management System Controls - Interface and Operational Considerations

3:00pm – 3:15 Networking Break

3:15pm – 4:00 Monitoring Geothermal Systems

Matt Davis, PhD, Vice President, Ground Energy Support, Dover, NH

- The Geothermal HVAC system – The Value of System Assessment
- What's important, and to whom?
- What is the difference between Monitoring and Metering?
- Performance Metrics – What should be measured?
- Tracking Cost Savings & Carbon Offsets
- Value for trending of key performance values – End User
- Value for trending of key performance values – GSHP Industry

4:00pm – 4:40 Commissioning GHP Systems – Achieving Anticipated Performance

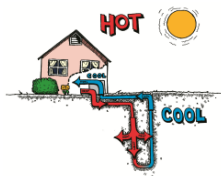
Julia Weatherby, PE, LEED AP, Senior Mechanical Engineer, Lindgren and Sharples, P.C., Springfield, MA

- How is a GHP HVAC system "Commissioned?"
- Design and Installation Mistakes – Where do they hide?
- What observations and measurements cannot be overlooked?
- Retro-commissioning of existing systems

4:40pm – 4:50 Wrap-up and Adjourn

- Further Questions and CEU sign-out

"Best one-day program on GEOTHERMAL"



Another Education Program from:
American Ground Water Trust
 50 Pleasant Street (Suite 2)
 Concord, NH 03301



GEO THERMAL

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Innovations: Design, Financing and Regulation

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 265 Lakeside Ave, Marlborough, MA 01752**

- ☞ GEO REDUCES THE CARBON FOOTPRINT
- ☞ GEOTHERMAL COMMISSIONING METHODS
- ☞ NET-ZERO ENERGY BUILDINGS - HOW TO GET THERE
- ☞ THERMAL PURCHASE AGREEMENTS and LOOP LEASING
- ☞ SYSTEM MONITORING and PERFORMANCE INTEGRATION

GEOTHERMAL PROGRAM -- REGISTRATION FORM

Wednesday, October 23, 2013 ~~ Holiday Inn & Suites Marlborough, 265 Lakeside Ave, Marlborough, MA 01752

Registration (General)[All walk-in registrations on event day \$225]	\$195	<input type="checkbox"/>
Registration (AGWT Members)	\$165	<input type="checkbox"/>
Registration (Government- federal state, county, local)	\$165	<input type="checkbox"/>
Registration (Official Representatives of 501(c)(3) Organizations)	\$165	<input type="checkbox"/>
Registration (Member of American Planning Association)	\$165	<input type="checkbox"/>
Registration (Member of CT Geothermal Association)	\$165	<input type="checkbox"/>
Registration (Member of ASHRAE – Boston Chapter)	\$165	<input type="checkbox"/>
Registration (Member of ASHRAE – CT Chapter)	\$165	<input type="checkbox"/>
Registration (Member of ASHRAE – NH [Granite State] Chapter)	\$165	<input type="checkbox"/>
Registration (Member of IGSHPA)	\$165	<input type="checkbox"/>
Registration (Member of MA Ground Water Association)	\$165	<input type="checkbox"/>
Registration (Member of NEGPA)	\$165	<input type="checkbox"/>
Registration (Member of NH Water Well Association)	\$165	<input type="checkbox"/>
Registration (Full-time Student) (ID required)	\$ 90	<input type="checkbox"/>
CD of Presentations (\$50 for non-Registrants)	\$ 20	<input type="checkbox"/>
Exhibit Table (does not include registration)	\$200	<input type="checkbox"/>

CANCELLATION POLICY

- Cancellations received in the AGWT office by 5 pm EST 5 days prior to event will receive a full refund less \$25.
- For cancellation 4-2 days prior to the there is a 50 % refund.
- Cancellations one day prior to the start of the event or on the day of the event are considered "No Shows" and no refund will be made - (substitutions gladly accepted).
- The Trust will not cancel a program because of bad weather conditions. Except that, as the result of an event cancellation resulting from, (but not limited to) circumstances such as a state mandatory evacuation or a fire at the program facility, the Trust will reschedule the event and honor registrations as payment for the new event.

TOTAL \$ _____

PAYMENT: Check *[payable to: American Ground Water Trust]*
 AMEX Visa MasterCard PO

Credit Card or PO No. _____ **Expiration** _____

Cardholder Name _____

Registration Name _____

Title/Position _____

Company/ Organization _____

Address _____

City _____ **State** _____ **Zip** _____

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The **Holiday Inn** is holding a limited number of rooms at a **special room rate of \$105** for attendees through October 11 under the "American Ground Water Trust" event. Call: Tel: 508-481-3000.

Return by mail: American Ground Water Trust, 50 Pleasant Street, Concord, NH 03301

Return by fax: (603) 228-6557

Call to register (800) 423-7748

Register on line <http://www.agwt.org/events>