

GEOHERMAL HEATING AND COOLING INNOVATIONS: DESIGN, FINANCING AND REGULATION

WORKSHOP

Location: Red Lion Hotel, 1021 NE Grand Avenue, Portland, OR 97232

Date: Tuesday, May 14, 2013

Time: 8:00am to 4:45pm

Convened by the:

American Ground Water Trust

Concord, NH

501(c)(3) Education Organization



SPONSORS



In cooperation with:

International Ground Source Heat Pump Association

Continuing Education Credit

Architect Credits – 7.25 LUS (FOR HSW), AMERICAN INSTITUTE OF ARCHITECTS (PROVIDER G521)

Professional Engineers – 7.25 CONTACT HOURS – CERTIFICATE OF COMPLETION ISSUED POST-EVENT

Oregon Home Inspectors – 4.5 CCB CEU Credit THROUGH THE CONSTRUCTION CONTRACTORS BOARD (CCB)

Oregon Water Well Constructors - CEU Credit - THRU THE OREGON DEPT OF WATER RESOURCES (PENDING)

Washington State Water Well Drillers – 7.0 CEU Hours THRU THE WA DEPT OF ECOLOGY

Call for updates and 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, 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 industry-accepted installation, operation and maintenance practices.
- 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 – 8:35 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

8:35am – 9:15 Status of the Geothermal Industry

Ted Clutter, Manager- Outreach and Member Services, Geothermal Exchange Organization, Washington DC

- What is GEO?
 - The Geothermal Exchange Organization
- Geothermal Heat Pump Market Perspectives
 - National Overview • Residential / Commercial • Potential Drivers
- Market Barriers and Incentives for Geothermal Heat Pumps
- Legislative Efforts to Grow the Industry
 - GEO's Work at the Federal and State Levels

9:15am – 9:55 Reducing First Cost Barriers - Geothermal HVAC Project Financing Innovations

Eric Howarth, VP of Contractor Services, Electricity and Gas Industry Association, Sacramento, CA

- Alternative financing models to help customers over first-cost barriers and increase sales:
- System Leasing Options verses Thermal Purchase Agreements verses System Rental Agreements
- How do geothermal installations add equity value to a property?
- Can these models be retrofitted to existing installations?
- How does monitoring enhance system support and warranty?
- How do these financing options increase GHP HVAC system sales?

9:55am – 10:10 Networking Break

**10:10am – 10:50 GeoExchange Loop Ownership by Utilities -
The Western Farmers Electric Cooperative Experience**

Mark Faulkenberry, Mgr of Marketing & Communications, Western Farmers Elec. COOP, Anadarko, OK

- How do utilities benefit from owning the GeoExchange loop?
- How does the on-bill financing model work?
- What is the typical payback period and Return on Investment (ROI)?
- Who is eligible for the Federal and State incentives available for the new system?
- What type of energy monitoring is needed to document BTU usage?
- Liability - What role do designers and installers play in the process?

10:50am – 11:30 More than a “hole in the ground”- Drilling techniques - Logistics and Grout

Kirby Donald, Account Representative Lead, Baroid IDP, Castle Rock WA

- 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

11:30am – 12:10 Designing with Variable Frequency Drive Compressor Geothermal Heat Pumps – Special Considerations

Sean Dillon, Western Regional Sales Manager, WaterFurnace International, Seattle, WA

- How does a VFD compressor GHP work? VFD GHP Applications
- Loop design- Turbulent Flow- Is it still necessary?
- Can VFD GHPs reduce the size of a loop field
- Conditioned Space Zoning Options and System Control Requirements

12:10pm – 1:00 Lunch

1:00pm – 1:40 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

1:40pm – 2:20 Designing Ground Loop HVAC Systems - Pump Energy Optimization Using Variable Frequency Drives

Andrew Chiasson, PE, Research Engineer, Professor, Oregon Tech, Klamath Falls, OR

- 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

2:20pm – 3:00 Net-Zero Design Principles

Paul Bony, Director of Residential Market Development, ClimateMaster, Montrose, CO

- How is Net-Zero defined: cost, emissions, site, source
- Why are GHPs the best HVAC system choice for a Net-Zero building?
- Design concepts that optimize Geothermal Heat Pumps with Solar Thermal and PV
- Energy Demand Reduction Strategies and Management Systems

3:00pm – 3:15 Networking Break

3:15pm – 3:55 Commissioning a GHP System – Missing the Last Step Costs Money

Alan Wright, PE, Commissioning Engineer, Environmental and Engineering Services Inc., Corvallis, OR

- How is a GHP HVAC system “Commissioned?”
- Design and Installation Mistakes – Where do they hide?
- What observations and measurements cannot be overlooked?
- Case Study - HQ/P2 building at the Port of Portland

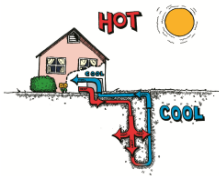
3:55 – 4:35 Geothermal HVAC Cost Evaluation – Examples from the Columbia River Gorge

John Geyer, CGD, President, John Geyer & Associates, Inc, Vancouver, WA

4:35 – 4:45 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

Get CEUs

Innovations: Design, Financing and Regulation

Tuesday, May 14th, 2013, Red Lion Hotel
 1021 NE Grand Avenue, Portland, OR 97232

- ☞ GEO REDUCES THE CARBON FOOTPRINT
- ☞ GEOTHERMAL COMMISSIONING METHODS
- ☞ NET-ZERO BUILDINGS - HOW TO GET THERE
- ☞ FINANCIAL INCENTIVES & ALTERNATIVE FINANCING
- ☞ THERMAL PURCHASE AGREEMENTS & LOOP LEASING
- ☞ GEOTHERMAL HEATING AND COOLING - SAVES \$\$\$ and ENERGY

GEOTHERMAL PROGRAM -- REGISTRATION FORM

May 14, 2013 -- Red Lion Hotel, 1021 NE Grand Avenue, Portland, OR 97232

Registration (General)	\$195	<input type="checkbox"/>
Registration (AGWT Members)	\$165	<input type="checkbox"/>
Registration (Government- fed, state, local)	\$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"/>

[Walk-in registration (on day of event) \$225]

TOTAL \$ _____

PAYMENT: Check [payable to: American Ground Water Trust]
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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.

SPONSORSHIP & EXHIBITS

Showcase company achievements, expertise, projects, products & services
 Call 800 423-7748 or visit web-site

The Red Lion Hotel is holding a limited number of rooms at a special room rate of \$99 (single or double) for attendees through April 30 under the "American Ground Water Trust" event.
 Call: 503-235-2100.

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> (Conferences/workshops)