GEOTHERMAL HEATING AND COOLING : DESIGN, FINANCING, ECONOMICS AND REGULATION IN NEW ENGLAND

WORKSHOP PROGRAM

Convened by the: **American Ground Water Trust**
501(c)(3) Education Organization

In partnership with:
New England Geothermal Professional Association

NEGPA™ New England Geothermal Professional Association

October 1st, 2014 ~ DoubleTree by Hilton Leominster, 99 Erdman Way, Leominster, MA 01453

SPONSORS

Preferred Pump

In cooperation with:

International Ground Source Heat Pump Association
WaterFurnace International

Continuing Education Credit

Architect Credits – 7.25 LUS (For HSW) Approved Through the American Inst. of Architects (Provider #G521)
Well Drillers CE approval requested for those New England states requiring pre approval.
IGSHPA Accredited Installers – 0.75 CEU's

WHO SHOULD ATTEND?

This program is geared to home builders, developers of residential and commercial properties 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, 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. The technology is changing…….. what you knew about geothermal economics and technology a few years ago has likely changed as new equipment and controls have improved efficiency.

WHAT IT IS ALL ABOUT

Geothermal heating and cooling technology can be applied to virtually all types of space-conditioning, 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 regulations 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 subsides available for installing geothermal
- Demonstrate the environmental and strategic benefits of the technology
- Explain the importance of proper ground loop installation and groundwater protection
- 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
- Describe the special steps and importance of geothermal system commissioning
- Provide an update on state, local and federal regulatory issues

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. This one-day program is an incredible opportunity to learn from experienced professionals who are on the forefront of geothermal innovation.

New England Program

7:15 – 8:00 REGISTRATION

8:00 – 8:15 RESOURCE SUSTAINABILITY AND GEOTHERMAL HEATING AND COOLING CONCEPTS

Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH

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

8:15 – 9:00 STATUS OF THE GEOTHERMAL INDUSTRY

Martin Orio, President – NEGPA and V.P. Business Development, Water Energy Distributors, Inc., Hampstead, NH

- The work of GEO at the Federal and State Levels
- NEGPA's activities in New England
- National overview of the status of the residential and commercial geothermal industry
- Efficiency comparison of Ground Source Heat Pumps (GSHPs) and Air Source Heat Pumps (ASHPs)
- Comments on financing options for heating and cooling technologies

9:00 – 9:45 LOOP DESIGN TO ACHIEVE MAXIMUM PERFORMANCE

Jay Egg, President, Egg Geothermal, Tampa, FL

- Key aspects of loop design to optimize temperature transfer
  - Closed Loops and Open Loops
  - Some older installations may not be providing optimal performance
- How to evaluate existing system performance and if needed, make improvements
- What data are needed to ensure that a redesign will work?
- Case Study: Sussex County, Delaware - Emergency Operations Center (EOC)
- Comments on financing options for heating and cooling technologies

9:45 – 10:15 MASS SAVE® RESIDENTIAL NEW CONSTRUCTION PROGRAM

Mark Pignatelli, Account Manager in support of the Massachusetts Residential New Construction Program, Cambridge, MA

- Overview of the Mass Save Residential New Construction Program
  - Incentives and technical assistance for energy efficient new construction and gut renovations
- About Mass Save:
  - Mass Save is an initiative sponsored by the Massachusetts' gas and electric utilities and energy efficiency service providers. The sponsors work closely with the Massachusetts Department of Energy Resources to provide a wide range of services, incentives, trainings, and information promoting energy efficiency.

10:15 – 10:30 BREAK

10:30 – 11:15 GHP HVAC DESIGN WITH VARIABLE FREQUENCY DRIVE COMPRESSOR GEOTHERMAL HEAT PUMPS

Jim Sansoucy, WaterFurnace

- How does a VFD compressor GHP work?
- Loop design- Turbulent Flow- Is it still necessary?
- Can VFD GHPs reduce the size of a loop field?
- Duct Sizing and Layout Considerations- The old rules apply, but with new options
- How does the VFD GHP help to balance air flow?
- VFD GHP Application

11:15 – 12:00 LOGISTICS INVOLVED WITH DRILLING AND COMPLETING GROUT AND LOOP INSTALLATION IN GEOTHERMAL BORES

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

- Criteria for selecting a drilling contractor for geothermal projects
- How site conditions and geology may influence the selection of drilling methods
- Geothermal Design – What geologic data are needed – what are not?
- Installing the vertical loop into the drilled bore – Do's and don'ts that save money
- The importance of selecting (and correctly placing) geothermal grouts for optimum temperature transfer

12:00 – 1:10 LUNCH

1:10– 1:55 GEOTHERMAL SYSTEMS IN NEW ENGLAND

Matt Davis, Associate Professor, University of New Hampshire, Durham, NH

- New England geological conditions and geothermal design
- The value of system assessment for geothermal HVAC systems
- Performance metrics – What should be measured?
- Tracking cost savings & carbon offsets

1:55 - 2:30 INSTALLING GROUND LOOPS: THE INSTALLERS PERSPECTIVE

Roger Skillings, President Skillings & Sons, Amherst, NH

- Experiences in communicating with the customer
- The importance of accurate load calculations from the designer
- New England installation experiences: - installing closed loop vertical bore holes
  - installing standing column wells - installing horizontal loops - installing pond loops

2:30 – 3:05 ENERGY REDUCTION STRATEGIES - WHY THE NEED FOR PROPER SEQUENCING?

Peter Governale, Owner, Tuscany Design Build, Inc., South Windsor, CT

- Getting the building right
- Load calculations: the good and the bad
- How to max your site assets for peak GSHP effectiveness

3:05 – 3:20 BREAK

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3:20 – 4:10 EIGHT YEARS OF OPERATION: 615 TON GEOTHERMAL INSTALLATION IN NORTHERN NEW HAMPSHIRE

Carl Orio, Chairman, Water Energy Distributors, Hampstead, NH

- Large load standing column well (SCW) construction methods
- Load balancing of parallel SCW fields
- SCW field-to-field thermal effects
- Bleed effect on a SCW
- Operational cost compared to other similar projects

4:10 – 4:40 PRESENTATION OF AN EXCEL SPREADSHEET THAT COMPARES PUBLISHED PERFORMANCE INFORMATION BETWEEN AIRSOURCE AND GROUNDSOURCE HEATPUMPS

Martin Orio, V.P. Business Development, Water Energy Distributors, Inc., Hampstead, NH

4:40 – 4:45 WRAP-UP AND ADJOURN