Geothermal Education Program – Salt Lake City, Utah

USING THE EARTH'S RENEWABLE ENERGY

Tuesday, April 10, 2012
Holiday Inn Hotel and Suites, Salt Lake City - Airport West
5001 W. Wiley Post Way, Salt Lake City, Utah, 84116

Ground Source Heating & Cooling for Residential and Commercial Properties

Latest Technologies, Economic Advantages, Environmental Impacts and Regulations

Presented by:
American Ground Water Trust
50 Pleasant Street, Concord, NH
501(c)(3) education organization

THANK YOU TO OUR SPONSORS:

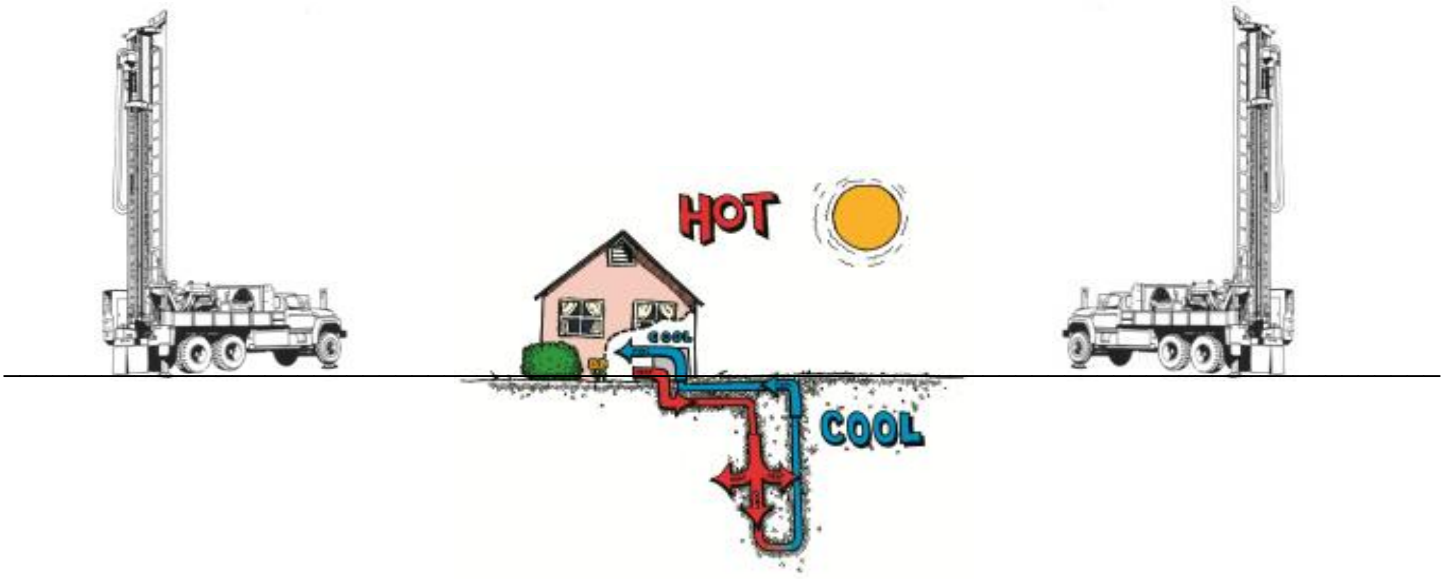
Baroid IDP **ClimateMaster** **Preferred Pump** **GEO**

In cooperation with:

GEO and International Ground Source Heat Pump Association

Continuing Education Credit

Architect Credits – 7.25 LUs (FOR HSW AND SUSTAINABLE DEVELOPMENT) THROUGH THE AIA
American Society of Home Inspectors – 7.0 ASHI® CE CREDITS
IGSHPA Accredited Installers – 0.75 CEU's
Utah Water Well Contractors – Pending Approval
Green Buliding Certification Institue Provider – GBCI Continuing Education Hours Pending Approval
Call for details about other professions - 800-423-7748



WHAT IT IS ALL ABOUT

Geothermal, (Ground source heating and cooling) (GSHC) technology provides a proven method for saving energy costs for heating, cooling and hot water generation. Thousands of homes, businesses and manufacturing plants across the nation are already taking advantage of these energy-efficient conditioning systems. GSHC systems operate at significantly lower costs than traditional gas, oil or electric-based installations. National benefits from geothermal installations include less demand for energy generation capacity, reduction in green-house gas emissions and a reduced dependence on imports of fossil fuels. Installation of ground source systems involves accessing the sub-surface by excavation or by drilling vertical bores. Because the sub-surface heat-exchange process occurs near or beneath the groundwater table, environmental and water resource regulatory issues make it important to "do the job right." Correct design, materials specification and installation are critically important to maximize efficiency and minimize risk. There is not a one-size-fits-all for geothermal.

The Program will:

- ➔ Show the professional connections among designers, manufacturers and installers
- ➔ Provide the "state of the art" in terms of design options and pay-back calculations
- ➔ Demonstrate the environmental and strategic benefits of the technology
- ➔ Explain the tax-breaks, incentives and subsides available for installing geothermal
- ➔ Dispel myths about the effectiveness, reliability & safety of ground source systems
- ➔ Explain industry-accepted installation, operation and maintenance practices
- ➔ Provide an update on state, local and 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.

PROGRAM

7:15 – 8:00 REGISTRATION

8:00 - 8:15 ENERGY & WATER
Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH

- Concept of Resource Sustainability
- Environmental Issues related to "Geothermal" technology
- Role of "Independent Education" in energy issue awareness
- Is shale-gas an energy "game-changer?"
- The importance of "doing it right" for geothermal installations (No shortcuts – No one-size-fits-all)

8:15 – 9:00 THE STATUS OF THE "GEOTHERMAL" INDUSTRY
Ted Clutter, Outreach and Membership Services, GEO, Spokane, WA

- 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
- What appear to be the barriers to greater acceptance of geothermal installations?

9:00– 9:45 GROUND SOURCE EARTH COUPLING DESIGN PRINCIPLES
Cary Smith, Sound Geothermal, Sandy, UT

- Explanation of the methods:
  - Closed loop – vertical, horizontal (slinky)
  - Open system – to surface, to diffusion
  - Heat exchanger systems for surface water (ponds and lakes)
- Weighing positives and negative aspects of each earth coupling method
- Design considerations for geothermal wells in bedrock vs. shallow sand & gravel wells
- What makes one well more efficient than another for thermal transfer?
- "State of the Art" GX systems

9:45 - 10:00 NETWORKING BREAK

10:00– 10:45 GROUND SOURCE HEAT PUMPS - THE FUNDAMENTALS
Cary Smith, Sound Geothermal, Sandy, UT
David Eckels, Sound Geothermal, Sandy, UT

- Understanding the basic physics of the heat transfer process
- Explanation of terminology (geoexchange, geothermal, ground source, BTUs, tons etc.)
- What happens to the heat transferred underground – where does it go?
- How to measure the efficiency of geothermal systems
- What makes a "good" system? What should a home inspector, Realtor or purchaser look for?
- Aquifer thermal energy – a technology whose time is imminent?
- Computer models available for geothermal design

10:45 – 11:30 GEOEXCHANGE INSTALLATIONS-STATE and LOCAL RULES and REGULATIONS
Jim Goddard, P.G., Well Program Manager, Utah Division of Water Rights, SaltLake City, UT

- Current federal and state regulatory requirements
- The development of new rules for closed loop heat borings
- Permit application requirements for installation of a geothermal well/system
- Well construction requirements
- Licensing requirements for well and heat-exchange equipment installers
- Environmental and health concerns from geothermal installation/ operation

11:30 – 12:15 STATE AND FEDERAL ENERGY INITIATIVES - GROUND SOURCE ENERGY OVERVIEW
Jeffrey H. Barrett, Renewable Energy Development Coordinator,
Office of Energy Development, Salt Lake City, UT

- Overview of state energy Initiatives
- Potential impact of geoexchange technology on energy security
- The state income tax credit for geothermal heat pump installation (residential / commercial)
- How to apply, where to find the link, what key information is required
- Data on geothermal installations throughout the state based on applications received

12:15 – 1:15 LUNCH

1:15 – 2:00 GEOEXCHANGE SYSTEM INSTALLATIONS The LEED PERSPECTIVE
Trey Austin (invited), **Vice President, Geo-Energy Services, Englewood, CO**

- Overview of the various Green Building rating systems:
  - United States Green Building Council (USGBC)
- Overview of the LEED rating systems - Commercial vs. Residential
- How is a building's heating and cooling system (energy-use) evaluated in the LEED rating system?
- How do Ground Source Heating and Cooling systems achieve LEED rating points?
- Role of Geothermal in energy-neutral design for commercial buildings

2:00 – 2:45 GEOEXCHANGE WELL / BORE CONSTRUCTION AND LOOP INSTALLATION
Doug Keller, Field Sales Representative, Baroid IDP, Salt Lake City, UT

- Criteria for selecting a drilling contractor for geothermal projects
- Matching the drilling equipment and drilling methods to the geological and site conditions
- Collecting geologic data for the geothermal designer
- Installing the vertical loop into the drilled bore
- Grouting material properties and options for geothermal projects
- Techniques of grout placement to meet geothermal design specifications

2:45 – 3:00 NETWORKING BREAK

3:00 – 3:45 **FINANCING INNOVATIONS FOR GEOTHERMAL INSTALLATIONS**
Paul Bony, Director of Residential Market Development, ClimateMaster, Montrose, CO

- Best practices for implementation based on financing and geoexchange programs.
- Consumer-friendly long term financing for "new" or "retrofit"
- How utilities can establish geoexchange by leveraging federal tax credits
- On-Bill financing methods
- Utility loop ownership – own the loop and recover cost over time
- Payback calculations for geothermal
- Making space conditioning costs a fixed expense
- Thermal purchase agreements

3:45 – 4:30 **GROUND SOURCE HEAT PUMP CASE STUDIES**
Steve Lauritzen, Comfortech, Orem, UT

- Commercial applications of geothermal in Utah
- Geothermal in large homes (12,000 square feet)
- A 17 home residential development at Dugway Proving Grounds.
- Multi-family town home projects in South Jordan
- Before and after data from homes retrofitted with geothermal

4:30 **ADJOURN**

GEOTHERMAL IS GROWING!

!! DON'T GET LEFT BEHIND !!

AMERICAN GROUND WATER TRUST

The *American Ground Water Trust* is a non-profit organization that promotes awareness, cooperation and action among individuals, groups and organizations. It has the core mission of promoting "science as the basis for water policy." Specifically, the AGWT's conference and workshop programs and educational materials:

- **Communicate the environmental and economic value of ground water**
- **Showcase ground water science and technology solutions**
- **Increase citizen, community and decision-maker awareness**
- **Facilitate stakeholder participation in water resource decisions**