

# CALIFORNIA GEOTHERMAL WORKSHOP

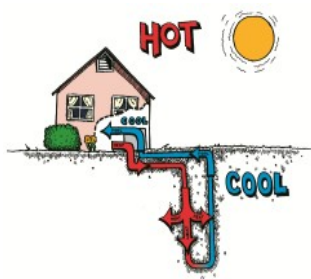
## Ground source heat pumps HEATING AND COOLING



**CARBON FOOTPRINT**

**Heating:**  
50 - 70% less than traditional systems

**Cooling:**  
20 - 40% less than typical A/C units



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

In partnership with:



Sponsored by



Preferred Pump

**Thursday, March 31<sup>st</sup>, 2016 - 8:00am to 4:30pm**  
**Crowne Plaza Los Angeles-Commerce Casino, 6121 Telegraph Rd, Commerce, CA 90040**

Geothermal is alive and well and growing as the technology of choice for heating and cooling of residential, commercial, religious, educational and industrial buildings. This workshop brings the industry's top geothermal experts from design, manufacture and installation to focus on the market potential for the technology. Take the time to attend this workshop and get the state-of-the-art update. Meet with industry leaders and experts who will answer your questions about the economics and benefits of installing geothermal in your home, building or campus as retrofit or new installation.

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 energy conscious home buyers and commercial property owners considering "green energy" options for commercial or residential installations. Don't miss the opportunity to get up to speed with this technology.

The workshop is being held in cooperation with:  
California Groundwater Association  
Southern California Chapter of ASHRAE  
International Ground Source Heat Pump Association



## REGISTRATION (Coffee, fruit & pastries)

8:00 – 8:15

### STRATEGIC, ECONOMIC AND ENVIRONMENTAL BENEFITS OF GEOTHERMAL HEAT PUMPS

Bill Martin, President, California Geothermal Heat Pump Association, Santa Rosa, CA,

- Status of ground source geothermal (International, National and in
- Geothermal technology and California's energy and water nexus
- Introduction of the team of presentation experts

8:15 – 8:55

### HOW GROUND SOURCE GEOTHERMAL SYSTEMS WORK

Lisa Meline, President, Meline Engineering, Sacramento, CA, and,

Jay Egg, President, Egg Geothermal, Orlando, FL

- Explanation of terminology (geoexchange, geothermal, ground source, BTUs, tons etc.)
- Evolution of the technology for HVAC applications
- Understanding the basic physics of the heat transfer process
- What happens to the heat transferred underground – where does it go?
- How to measure the efficiency of geothermal systems
- Aquifer thermal energy – a technology whose time is imminent?

8:55 - 9:35

### GEOTHERMAL DESIGN CONFIGURATIONS

Lisa Meline, PE, President, Meline Engineering, Sacramento, CA

- Closed loop systems – vertical, horizontal (slinky)
- New North American ground loop installation standards
- Open system – to surface, to diffusion
- Heat exchanger systems for surface water (ponds and lakes)
- Innovations for heat exchange (foundations, “used” and recycled water mains)
- Importance of measuring sub-surface thermal conductivity
- Weighing positives and negative aspects of earth coupling methods

9:35 – 10:15

### GEOTHERMAL INSTALLATIONS – QUICKEST ROUTE TO NET ZERO

Bill Martin, President, California Geothermal Heat Pump Association, Santa Rosa, CA, and,

Paul Bony, Director, Renewables & Contractor Development, Electric & Gas Industries Assn., Sacramento, CA

- LEED, Geothermal, net zero and State energy policy
- Differences between LEED rankings and California title-24 regulations
- Geothermal impacts on cooling tower water use
- Geothermal impacts on Carbon footprint
- The 2-2000-16 plan: two tons of GHP will serve 2,000 sf in any of 16 climate zones
- Comparison of HVAC system performance in ASHRAE HQ building in Atlanta

## 10:15 – 10:30 BREAK

10:30 – 11:10

### GEOTHERMAL UTILITIES; GEOTHERMAL SYSTEMS; GEOTHERMAL BASED DEVELOPMENTS

Jay Egg, CMC, President, Egg Geothermal, Tampa, FL

- Geothermal “Mini-grids” for geothermal energy transfer and load sharing
- Examples of successful geothermal implementation for housing developments
  - Schooner Bay mini-grid, Great Abaco Island, Bahamas
  - Whisper Valley, Austin TX – 7,000 home development using geothermal
  - Serenbe Urban Village, Atlanta, Georgia
- Geothermal education innovations

11:10 – 12:30

### GEOTHERMAL CASE STUDIES FROM CALIFORNIA AND BEYOND – Design and operation

Presented by practitioners familiar with the projects

#### RESIDENTIAL [single family homes]

Bruce Sanguinetti, Sierra EcoSystems, Genoa, NV

Description of four California residential installations

Bill Martin, Martin Energetics, Santa Rosa, CA

The Quincy, CA Carbonless Zero Net Energy House

COMMERCIAL & GOVERNMENT [Office, retail, public purpose]

Lisa Meline, Meline Engineering, Sacramento, CA  
Sunnylands, Rancho Mirage and NPS Santa Monica  
Steve Guttman, Guttman and Blaevoet Engineers, San Francisco, CA  
Rancho Los Alamitos, Long Beach  
Big Rock Ranch, Marin County

EDUCATION & CAMPUS [Schools, colleges, universities]

Lisa Meline, Meline Engineering, Sacramento, CA  
San Francisco City College retrofit, Ohlone College Project  
Bill Martin, CaliforniaGeo, Santa Rosa, CA  
Feather River College

12:30 – 1:30 LUNCH

1:30– 2:10

DRILLING AND COMPLETING GROUT AND LOOP INSTALLATION IN GEOTHERMAL BORES

Bill Douville, Technical Field Representative, BAROID Industrial Drilling Products

- 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 are needed – what are 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

2:10 – 2:30

GEOTHERMAL DRILLING – CASE STUDY EXAMPLES OF CALIFORNIA PROJECTS - Site work for loops

Michael Meyer, Gregg Drilling & Testing, Inc. Signal Hill, CA

- Sunny Lands Center, Annenberg Complex, Rancho Mirage, CA
- Rancho Los Alamitos, Long Beach, CA
- Antelope Valley Indian Museum, Lancaster, CA
- Private Residence, Brentwood (LA), CA

2:30 – 2:45 BREAK

2:45 – 3:30

FINANCING – AN IMPORTANT (AND OVERLOOKED) TOOL FOR GEOTHERMAL INSTALLATIONS

Paul Bony, Director Renewables & Contractor Development, Electric & Gas Industries Assn, Sacramento, CA

- The *GEOSmart* Financing Clearinghouse
- Split Loans – Payments are Post Tax Credits & Rebates
- The power of commercial financing (\$50K up front or \$1K monthly payment?)
- Commercial loans - \$25,000 to \$5 Million+
- Leverage financing as a sales tool
- Leases for non-profits

3:30 – 4:30

PRESENTERS PANEL - Q & A AND DISCUSSION AMONG ALL PARTICIPANTS

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

Topics for discussion to include:

- Do “regulations” constrain decisions to incorporate geothermal in new or retrofit projects?
- What role is there for geothermal technology in state sustainability policy objectives?
- Does the geothermal industry have the capacity to rapidly expand geothermal installations?
- What barriers do architects and the HVAC professions see for geothermal?
- What are the economics of capturing the thermal energy of waste water? (Energy “down the drain”)

4:30 END (Evaluation form completion and sign-out)