What Does it Take to Retrofit a Home or Business?

Geothermal and EE: A Nexus of RE and EE
The Association of Energy Services Professionals

- AESP.org
- Improving the delivery and implementation of EE, DR, and DG
- 2,000 + members
Clean Energy the Right Way

• Combining Geothermal with Energy Efficiency = Win/Win/Win
• The cleanest Btu is the one never consumed
• EE has the best Non-Energy Benefits
What Should You Do?

1. Comprehensive audit including blower door, infrared scan, systems inspection.
   - Seal, add insulation, maintain systems

2. IF new systems are warranted:
   - SIZE properly, consider tax credits, evaluate the payback from higher efficiency

3. Consider payment options
Energy Efficiency - Why?
Top 10 List

10. Costs Recovered
   - Can be profitable

9. Opens new markets
   - End-use advisor
   - Heat, cool, light
   - Higher interest in additional services
Energy Efficiency - Why?
Top 10 List

8. Politically Popular
   - Earn political capital

7. Economies of Scope
   - Synergies beyond the meter
   - Deeper relationship with our owners
   - Who understands energy use better?
6. Non-Energy Benefits

- Unmatched environmental benefits
- Comfort
- Safety
- Productivity
- Local job creation
Energy Efficiency - Why?
Top 10 List

5. Good Will with Traditional Adversaries
   - Regulators
   - Environmental advocates

4. Energy Independence
   - Individual
   - International
Energy Efficiency - Why?
Top 10 List

3. Bill Management
   ➢ Helps customers manage bills
   ➢ Net lower bills for customers

2. Customer Service Benefits
   ➢ Lowers bad debt
   ➢ Solution for high bill complaints
Energy Efficiency - Why?
Top 10 List

1. Customers WANT IT!
Satisfaction and Value Perception of the Cooperative

Percent responding with a high score (8-10 on 10 pt. scale)

Data courtesy of Midwest Energy, Hays, Kansas.
Planning Your Geothermal Retrofit

John Freitag, Executive Director
GAOI
OK, we’ve got the weatherization/weather sealing all done. Now what?

1. Planning the loop field/location.
2. Consider ducting issues.
3. Using a desuperheater?
5. Backup/emergency heating? Size of electric service is consideration.
6. Budget dollars and time for permitting.
What construction looks like…
Outside Considerations

- Where will the loop field be located?
- Vertical or horizontal?
- Do you have room?
- Setbacks and state codes?
The Loop Field

Loop field installation will leave a scar, but dirt will settle and lawn will go back to normal in time.
Ducting Issues

• Energy codes call for increased duct sealing.
• If radiant heat, does this power an existing hot water system?
• Can existing ducting adequately carry the air flow throughout the house/facility?
Ducting Cont’d

• Is there adequate return air in the building? Most older homes DO NOT have adequate return air.

• Check to be sure that ductwork is sized properly to allow for good air flow. Competent geothermal HVAC contractors can do this.

• Check for zoning controls/or need for zoning on some homes/facilities … particularly those with more than one level/story. Zoning, or installation of more than a single system can solve comfort issues like this.
Water heating is a byproduct of the geothermal system.
Water Heating, Cont’d

• Always use an electric water heater in this installation.
• GAOI recommends use of a buffer tank.
• Is there adequate space for water heater(s)?
• Wiring considerations
Replacing a gas furnace/central air with geothermal?

- A Dual Fuel installation might be a possibility.

- Always ensure that the electrical service to the house/facility is large enough to carry the geothermal system’s operation/electrical load.

- And is there room in the electrical panel?
Finally, Some Tips to Consider

• More than one quote/proposal may provide important alternative ideas/pricing info.
• Ask for contractor’s qualifications and credentials.
• Get references and ask about experience.
• How long has contractor been installing geothermal?
Final Tips

• Heat loss/gain calculation.
• What is percentage of total required heating load that will be met by the geothermal system without use of alternative or backup heat?
• Is ducting system and electrical service adequate?
Final Tips

• Warranty from manufacturer and contractor?

• Ask about the loop. How is it being sized and designed? How did the contractor determine how long it should be? Grouting considerations.

• Lastly, educate yourself before getting the system installed.
Removing Barriers to GEO

GEOTHERMAL LOOP PROGRAM

GEO\$ENTS
MAKING GEOTHERMAL AFFORDABLE

CORN BELT ENERGY
Your Touchstone Energy® Cooperative

GEOTHERMAL ALLIANCE OF ILLINOIS
Key Components of Geo¢ents

1. Geothermal becomes utility service
   a) Co-op owns the geothermal loop
   b) Co-op treats the loop as a utility asset
   c) Loops = Capital intensive and long-lived

2. Connection fee on utility bill
   a) Operating savings reflected on utility bill
   b) Matches savings with efficiency investment
Key Components of Geo¢ents

3. Fee is tied to the premise
   a) Like other utility infrastructure
   b) Frees co-op member from debt
   c) Requires notification – info lien
# Tearing Down the Barrier

## Capital Costs for Geothermal Installation

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<th>Tons</th>
<th>Total Cost</th>
<th>30% Tax Credit</th>
<th>Less Tax Credit</th>
<th>Cost of Loops</th>
<th>System less Loops</th>
<th>Rebate</th>
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Q&A

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