

Building your business  
on energy efficiency



# Building Up

Spring 2009



We're always looking for topics to feature in Building Up. Judging by high interest in ground source heat pumps (GSHPs) at the 2009 Energy Design Conference & Expo, many of you in the home construction industry want to know when these systems make sense. Our feature article offers insight from experts, plus a homeowner who installed a GSHP.

Also in this issue, you'll find information about new federal tax credits for energy efficiency. Knowing what improvements qualify and the requirements will help you maximize these powerful incentives.

Have a busy and productive construction season, building your business on energy efficiency.

Dean Tallbott  
Residential Program Manager



Check out past issues of *Building Up* online at [www.mnpower.com/triplestar](http://www.mnpower.com/triplestar) under New Construction (Triple E) link.

## HOT TOPIC—GROUND SOURCE HEAT PUMPS



Left to right: a GSHP in a residential setting can meet 100% of heating and cooling needs; homeowner Jim Swanson is a true believer in GSHP after installing one at his rural Duluth home; a horizontal slinky loop field being installed.

Jim Swanson describes himself as a “geothermal zealot.” Two years ago, this rural Duluth homeowner took a leap of faith, installing a closed-loop, horizontal ground-source heat pump (GSHP) as the sole source of heating and cooling for his new house. The system has exceeded expectations.

“We built a 2,500-square-foot house, and the installer estimated \$722 per year in heating and cooling costs,” Swanson said. “In our first full year, we spent a total of \$686 for heating and cooling the house and preheating our hot water.”

Not everyone is convinced that GSHPs live up to their hype. While some experts call them the most efficient, comfortable heating and cooling technology available and classify them as renewable energy, others claim they may not be as cost effective as natural gas systems and that energy efficiency and payback are often exaggerated.

The truth depends on where, when and how these systems are installed. That was an underlying message of *Ground Source Heat Pumps: Sorting Through the Confusion\**, a session at the 2009 Energy Design Conference & Expo. Presenters identified several factors to consider when determining the merits of a GSHP system:

- 1) **SITE CONDITIONS**—*Is the site appropriate? A typical residential, horizontal slinky system requires an approximate 50' X 120' footprint. For vertical bore applications, sites with ledge rock close to the surface might prove cost prohibitive.*
- 2) **SOIL**—*Does the soil have good conductivity? Wet, saturated soil transfers heat up to four times better than dry, porous sand or gravel.*
- 3) **COMPRESSOR TYPE**—*Does the system use a single- or dual-stage compressor? Dual-stage is significantly more efficient.*

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**If a GSHP is not right for your project,**  
*consider one of these energy-efficient alternatives:*

- Air source heat pump (ASHP)
- High efficiency gas furnace with ECM motor (95% efficiency for tax credit requirements)
- High efficiency water boiler (90+ efficiency range)
- Dual fuel heating with electric
- Off-peak storage heating

**Add drain water heat recovery (DWHR) to your comprehensive GSHP package of products and services.**

Your customer will conserve energy, save money, benefit the environment and receive a substantial rebate (see *Featured Incentives*). Learn more at [www.mnpower.com/dwhr](http://www.mnpower.com/dwhr).

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**4) COEFFICIENT OF PERFORMANCE (COP)**—*What is the COP? Higher is better, but verify performance claims. Typical annual COP ratings in northern Minnesota range from 3.0 to 3.5 on a properly installed system.*

**5) LOOP FIELD SIZING**—*Can you oversize the earth loop field? A larger loop field equates to higher efficiency and greater heating and cooling capacity (but the loop field is one of the more expensive components of a GSHP system).*


**6) NATURAL GAS AVAILABILITY**—*Is natural gas available? From a space heating perspective, GSHPs and natural gas heating systems cost about the same to operate, but be sure to factor in the cooling-related energy savings, since no additional air conditioner is needed with a GSHP. GSHPs may be more expensive to install, but when you consider the 30% tax credit with no minimum and utility rebates, the installed cost goes down considerably.*

**7) ANNUAL HEATING AND COOLING COSTS**—*What are the heating and cooling loads? Large homes with high heating and cooling costs have the greatest potential for savings.*

**8) AIR CONDITIONING**—*Does the homeowner plan to air condition? GSHPs can meet 100% of a home's heating and cooling needs, making an air conditioner redundant.*

“Know what questions to ask and get multiple quotes,” said Jeff Haase, demand efficiency supervisor at the Minnesota Office of Energy Security and one of the conference presenters. He added that consumers should be wary of prices that seem too good to be true.

“Try to get the highest efficiency product possible,” Haase said. “It may cost more up front, but investing in a well-installed, higher efficiency system should pay for itself through federal tax credits and greater energy savings.”

For example, a \$20,000 GSHP could result in a \$6,000 tax credit that goes directly to your customer's bottom line. 

*\* Get presentation materials for this and other 2009 Energy Design Conference sessions at [www.duluthenergydesign.com](http://www.duluthenergydesign.com)*



*for Energy Efficiency*

## TAX CREDITS FOR CONSUMERS

These home improvements qualify for tax credits at 30% of the cost (product plus installation) up to \$1,500 in 2009 and 2010 (existing homes only):

- Windows and doors
- Insulation
- Roofs (metal and asphalt)
- HVAC
- Water heaters (non-solar)
- Biomass stoves

These home improvements qualify for tax credits at 30% of the cost with no upper limit through 2016 (existing homes and new construction):

- Ground source heat pumps (GSHPs)
- Solar panels
- Solar water heaters
- Small wind energy systems

NOTE: Improvements must be made from January 1, 2009 through December 31, 2010 and be in the taxpayer's principal residence, except for GSHPs, solar water heaters, solar panels and small wind energy systems, where second homes and rentals qualify. Visit [www.mnpower.com/hvac](http://www.mnpower.com/hvac) for more information.

## TAX CREDITS FOR HOMEBUILDERS

Homebuilders are eligible for a \$2,000 tax credit for a new energy-efficient home that achieves 50% energy savings for heating and cooling over the 2004 International Energy Conservation Code (IECC) and supplements. There also is a \$1,000 tax credit to the producer of a new manufactured home achieving 30% energy savings for heating and cooling over the 2004 IECC.

Homes built to Minnesota Power's Triple E New Construction Tier II guidelines meet most tax credit requirements at no additional cost to builders.

Learn more at [www.energystar.gov](http://www.energystar.gov) and [www.mnpower.com/triplestar](http://www.mnpower.com/triplestar).

## Featured Incentives

**EDUCATE YOUR CUSTOMERS** about Minnesota Power's conservation incentives and build your business on energy efficiency.

**Ground Source Heat Pump (GSHP)** \$100 to \$200 per ton rebate for open and closed systems, respectively.

**Drain Water Heat Recovery (DWHR)** \$400 rebate for Minnesota Power customers who heat their water with electricity for installation of DWHR systems by trained installers. DWHR units can save up to 40% on water heating costs.

**Air Source Heat Pump** \$300 rebate for furnace-integrated systems (ductwork) and \$500 rebate for mini-split ductless systems, installed by program-trained contractor. Electricity must be a primary heat source.

Visit [www.mnpower.com/actionplan](http://www.mnpower.com/actionplan) for more information on tools to help your customers make energy-saving investments.

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