EnLink geoenergy

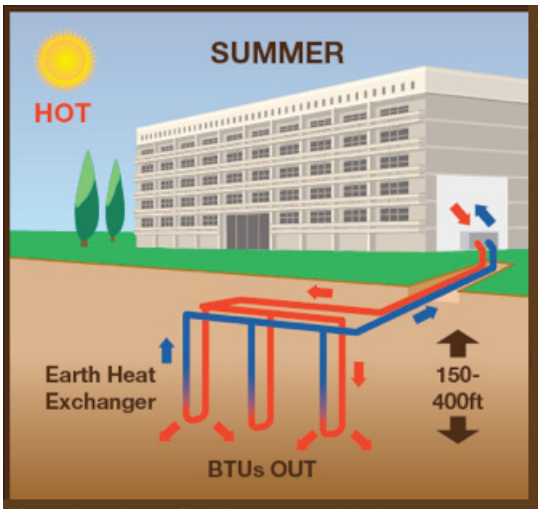
Geothermal heat pumps: Smart *for* the Grid

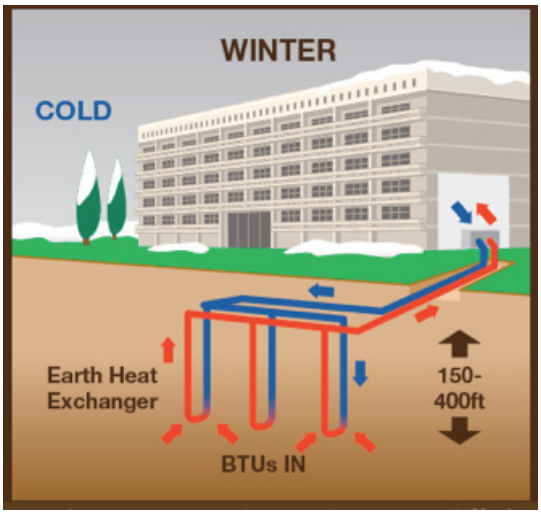
For utilities working overtime to solve the challenges of demand side management, energy efficiency and peak shaving, Geothermal Heat Pump systems (GHPs) provide a cost-effective and proven answer that can work virtually anywhere. **With efficiencies of up to 600%, a GHP system can reduce HVAC-related energy consumption by as much as 70 percent.** The widespread use of GHPs could dramatically reduce demand on the grid, reduce the need for new power plants and transmission lines, and reduce carbon emissions and other air pollutants.

Climate change concerns and energy efficiency requirements are changing the rate-making and operational paradigm for all utilities, as are policies such as decoupling and lost rate adjustment mechanisms. Industry leaders should think of GHPs as a tool that can help manage this new reality. And for utilities thinking about future investments, GHP systems could become part of their utility rate base.

GHPs use the earth as a heat sink during cooling mode and as a heat source during heating mode. Instead of using high and low temperature ambient air, high-efficiency GHPs use the moderate temperature of the water flowing through the system's underground heat exchange, decreasing energy use as much as 70% compared to a traditional HVAC system.

Like power plants and transmission lines, loops can be considered a valuable ratepayer asset. And, like solar panels and wind turbines, GHPs must be viewed as part of any renewable portfolio. In fact, GHPs heat exchange are even more reliable than "traditional renewable", as the earth's constant temperature is always available at the point of use, providing heating and cooling 24 hours a day, 365 days a year.





factors to consider

Geothermal heat pumps are a great value to a utility. They can save energy save resources save money *earn* money.

Greenhouse Gas Reductions:

GHPs can eliminate furnaces and boilers, resulting in zero on-site emissions. Reductions in overall energy consumption translate to an overall reduction in off-site emissions.

Water Savings:

GHPs can eliminate water-using technologies such as cooling towers and evaporative cooling systems, saving a significant amount of water. **The estimated water savings at one EnLink project in Nevada estimates nearly 1 million gallons of water savings annually.**

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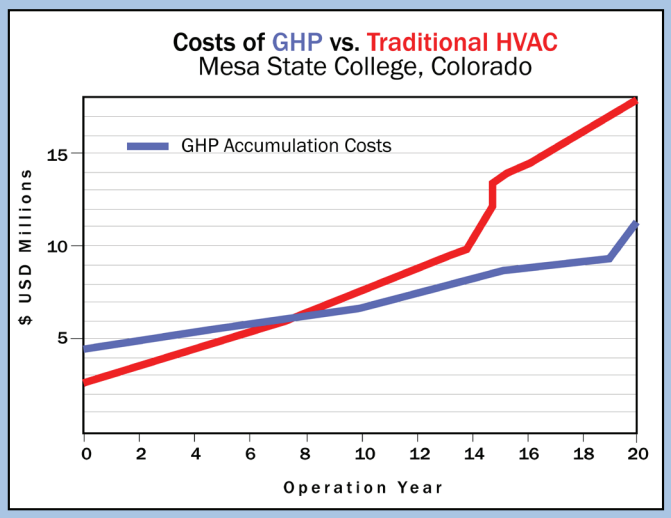

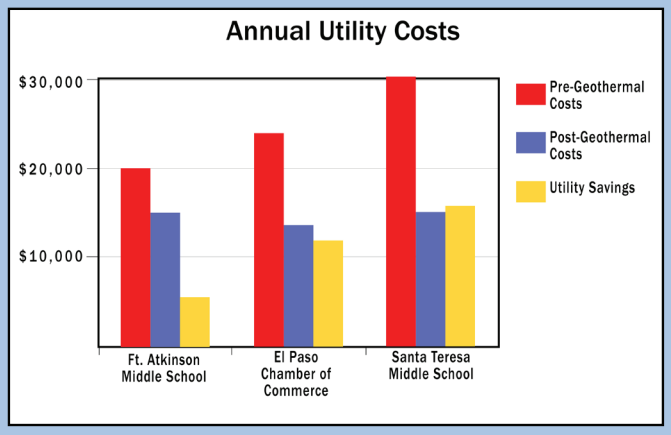

The figures above are estimates from past EnLink Projects. Actual savings may vary slightly.

Capital Costs of a Power Plant

All costs listed below are averages.

Pulverized Coal :	~$2500/kW
Nuclear:	~$3900/kW
Natural Gas Combined Cycle:	~$1200/kW
Wind Turbines:	~$2100/kW
Geothermal ("Big Geo" , hot rocks):	~$3100/kW
Solar:	~$3400/kW
Geothermal Heat Pump Systems:	~$2000/kW saved

From a CRS report to Congress November 2008: Cost to construct a power plant per kW of capacity.

LEED® program benefits:

GHPs offer the greatest single LEED® point contribution when compared to all other energy efficiency technologies, a tremendous value to ratepayers or "utility members" seeking these certifications.

Qualified Renewable Energy for Renewable Portfolio Standards (RPS)

Many states have required utility RPS. Some states allow GHPs to be considered as part of these renewable standards.

Loop Ownership

By paying for the installation of underground GHP Loop systems, utilities can rate-base the value of the equipment and sell BTU's to the customer.

GHPs as Profit Centers: LOOP LEASE/LOOP TARIFF

Some utilities have already begun investing in GHP ownership. Co-ops such as Plumas Sierra Rural Electric Co-Operative and Delta-Montrose Electric Association will pay for the installation of the ground loop at no cost to the homeowner, and will own and run the ground loop as if it were a central utility plant. This model can just as easily be applied to larger scale projects.

VALUES TO UTLILITIES

- Recover the cost of the loop, interest expense, program costs and earn more than their cost of funds through a loop fee.
- Gain earnings from incremental electric sales.
- Improve load factor without load control.
- Help customers lower their total energy bill.

SAMPLE OF ELECTRIC UTILITY VALUE

An installed loop on a residential site costs $6,000 (retail), a premium over high-end gas equipment with AC. The loop generates $410.64 in annual net margins.

Total Revenue after 30 years	Total IRR	Co-Op returns on poles & wires	Investor owned utility return on equity
$12,319	5.45%	ROI 3.8%	10-11%

Courtesy of Climate Master

Bottom Line: GHPs are Good for Utilities

Installing a GHP system is like investing in any other utility infrastructure: loop fields will outlive most buildings while providing significant environmental and economic benefits to ratepayers.

Utilities can take advantage of this opportunity by investing now.

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