



# GeoExchange<sup>SM</sup> Heating and Cooling Systems: Fascinating Facts

GEOEXCHANGE™

- GeoExchange (geothermal) systems are the most energy-efficient, environmentally clean, and cost-effective space conditioning systems available, according to the Environmental Protection Agency<sup>1</sup>.
- EPA found that GeoExchange heating and cooling systems can reduce energy consumption--and corresponding emissions--by over 40% compared to air source heat pumps and by over 70% compared to electric resistance heating with standard air-conditioning equipment.
- GeoExchange systems use the Earth's energy storage capability to heat and cool buildings, and to provide hot water. The earth is a huge energy storage device that absorbs 47% of the sun's energy -- more than 500 times more energy than mankind needs every year -- in the form of clean, renewable energy. GeoExchange systems take this heat during the heating season at an efficiency approaching or exceeding 400%, and return it during the cooling season.
- EPA found that, even on a source fuel basis -- accounting for ALL losses in the fuel cycle including electricity generation at power plants -- GeoExchange systems are much more efficient than competing fuel technologies. They are an average of 48% more efficient than the best gas furnaces on a source fuel basis, and over 75% more efficient than oil furnaces. In fact, today's best GeoExchange systems outperform the best gas technology, gas heat pumps, by an average of 36% in heating mode and 43% in cooling mode!
- The U.S. General Accounting Office estimates that if GeoExchange systems were installed nationwide, they could save several billion dollars annually in energy costs and substantially reduce pollution<sup>2</sup>.
- Surveys by utilities indicate a higher level of consumer satisfaction for GeoExchange systems than for conventional systems. Polls consistently show that more than 95% of all GeoExchange customers would recommend GeoExchange to a family member or friend.
- GeoExchange systems represent a savings to homeowners of 30 to 70% in the heating mode, and 20 to 50% in the cooling mode compared to conventional systems.
- Achieving the Geothermal Heat Pump Consortium's (GHPC) goal of 400,000 annual GeoExchange installations each year by 2001 will reduce U.S. greenhouse emissions by over 1 million metric tons of carbon each year relative to base case market projections. This reduction in carbon emissions is equivalent to taking over half a million cars off the road, or planting over a million acres of trees. After GHPC's program ends at that time, a self-sustaining GeoExchange industry will cause U.S. annual carbon emissions to decrease by an additional 450,000 tons -- every year! That translates into a total annual carbon reduction of at least 5 million metric tons by the year 2010.
- Achieving GHPC's goal of 400,000 installations per year by 2001 will save consumers over \$420 million per year in energy bills. After that, annual energy savings will increase by an additional \$170 million -- every year.

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<sup>1</sup> Environmental Protection Agency, Space Conditioning: The Next Frontier, Office of Air and Radiation, 430-R-93-004 (4/93)

<sup>2</sup> General Accounting Office, Geothermal Energy, Outlook Limited for Some Uses but Promising for Geothermal, (6/94)

