

Earth Storage Floor Heating System Residential Case Study

SmartRooms™
Thermal Comfort System
By Therma-Ray



Specifications

Heating System = Earth Thermal Storage	Year Built - 2004
Location - Anoka, MN	Power Supplier - Connexus Energy
Construction - Slab on Grade, 2 x 6 Walls with 9' and 10' Ceilings.	Electric Program - Dual Fuel
R-Values - Walls = R19, Ceiling = R38	Electric Rate - \$.031 per Kwh
Square Footage - 2,500 Sq.Ft.	Degree Days = 7,803

Homeowners looking for superior comfort, low energy costs and high quality with a great track record will love the SmartRooms complete line of radiant heating products.

Actual Kwh Usage & Operating Costs

2004 / 2005 Heating Season	- 14,920 Kwh	- \$462.52
2005 / 2006 Heating Season	- 15,040 Kwh	- \$466.24

Testimonial

"We absolutely love our floor heating system. I grew up with forced-air systems and just figured we would probably install something along those lines in our new home as well. We were also checking out the possibility of installing a geothermal system, but were terrified of the up front costs and not sure we would really ever realize a true payback on our investment. My wife and I were in a model home featuring the **SmartRooms** Radiant Heating systems and we couldn't believe how comfortable and warm we felt in each and every room and decided to check it out further. We had an installation and operating cost comparison done and didn't see any option that even came close to the comfort, efficiency, cost and maintenance of the **SmartRooms** system.

The operating costs are amazing and we're really glad we didn't decide to go with the geothermal system. We saved tens of thousands of dollars on the install and our home is still very inexpensive to heat.

The house is warm, we're comfortable, it's cheap to run and there is no maintenance. What more could you want." - Jerry Leyhe (Homeowner)

Cost Comparison of Heating Sources

		Rates	
Name:	Case Study - Earth Storage System	Heating Oil:	\$2.50 per Gallon
Project:	2,500 Sq.Ft. - Slab On Grade Home Dual Fuel Program 70° Inside Design Temperature -10° Outside Design Temperature	LP Gas:	\$1.69 per Gallon
		Natural Gas:	\$1.19 per Therm
		ETS - Electricity:	\$0.029 per kWh
		Dual Fuel - Electricity:	\$0.031 per kWh
		Electric Resistance:	\$0.065 per kWh
		Yearly Heating Load :	116,576,000 BTU's

	Efficiency Rating	Total Gallons Needed	Price / Gallon	Cost of Operation
Heating Oil	60%	1408	2.50	\$3,519.81
	70%	1207	2.50	\$3,016.98
	80%	1056	2.50	\$2,639.86

	Efficiency Rating	Total Gallons Needed	Price / Gallon	Cost of Operation
LP Gas	70%	1820	\$1.69	\$3,075.93
	80%	1593	\$1.69	\$2,691.44
	90%	1416	\$1.69	\$2,392.39

	Efficiency Rating	Total Therms Needed	Price / Therm	Cost of Operation
Natural Gas	70%	1665	\$1.19	\$1,981.79
	80%	1457	\$1.19	\$1,734.07
	90%	1295	\$1.19	\$1,541.39

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
Electric Resistance	100%	34166	\$0.065	\$2,220.82

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
ASHP Air Source Heat Pump	200%	17083	0.065	\$1,110.41

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
GSHP Ground Source Heat Pump	300%	11389	0.065	\$740.27

	Total kWh Needed	Price / kWh Rates	Cost of Operation
ETS Electric Thermal Storage	14920	0.031	\$462.52

	Total kWh Needed	Price / kWh Rates	Cost of Operation
ERC Electric Radiant Ceiling	17521	0.031	\$543.16

Oil=138,000 BTU/gal., LP=91,500 BTU/gal., NG=100,000 BTU/Therm, Electricity=3412 BTU/kWh
 Heating load is approximate but must stay constant for all fuel sources

Kwh Usage and Cost of Operation for ETS panels are actual costs. Comparison costs are an estimate.
 Actual costs will vary depending upon the rates and programs offered.