



Earth Storage Floor Heating System Commercial Case Study

SmartRoomsTM
Thermal Comfort System
By Therma-Ray



Specifications

- | | |
|--|---------------------------------------|
| • Heating System = Earth Thermal Storage | • Year Built - 2003 |
| • Location - Elk River, MN | • Power Supplier - Connexus Energy |
| • Construction - Slab on Grade, 2 x 6 Walls with 12' Ceilings. | • Electric Program - Off-Peak Storage |
| • R-Values - Walls = R19, Ceiling = R38 | • Electric Rate - \$.029 per Kwh |
| • Square Footage - 7,600 Sq.Ft. | • Degree Days = 7,803 |

Business Owners 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	- 41,653 Kwh	- \$1207.93
2005 / 2006 Heating Season	- 36,480 Kwh	- \$1,057.92

Testimonial

The retail business shown is a small engine repair, sales, service and rental shop open 12 hours a day and 7 days a week. Walk in traffic and the shop doors opening and closing throughout the day do not affect the comfort of a **SmartRooms** heated building.

Business owner Mike Cornelius says - **"Everyone that comes into our building is amazed at how warm and comfortable our building really is. Customers look around completely perplexed, trying to figure out how the building is heated. Even the shop area recovers quickly after the doors have been opened. Personally, my favorite part is the operating cost and that there is no maintenance necessary. We have many buildings in the area comparable to ours and I love to ask them about their heating bills and then watch the look on their face when I tell them what I'm paying. I am usually 1/3 - 1/2 of what they are paying. I recommend it quite often and would never build again without Smart Rooms in my business or own home"**

Cost Comparison of Heating Sources

		Rates	
Name:	Case Study - Earth Storage	Heating Oil:	\$2.50 per Gallon
Project:	7,600 Sq.Ft. - Slab on Grade Building 8 Hour Off-Peak Program 70° Inside Design Temperature -10° Outside Design Temperature 7,811 Actual Degree Days	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 :	275,000,000 BTU's

	Efficiency Rating	Total Gallons Needed	Price / Gallon	Cost of Operation
Heating Oil	60%	3321	2.50	\$8,303.14
	70%	2847	2.50	\$7,116.98
	80%	2491	2.50	\$6,227.36

	Efficiency Rating	Total Gallons Needed	Price / Gallon	Cost of Operation
LP Gas	70%	4294	\$1.69	\$7,256.05
	80%	3757	\$1.69	\$6,349.04
	90%	3339	\$1.69	\$5,643.59

	Efficiency Rating	Total Therms Needed	Price / Therm	Cost of Operation
Natural Gas	70%	3929	\$1.19	\$4,675.00
	80%	3438	\$1.19	\$4,090.63
	90%	3056	\$1.19	\$3,636.11

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
Electric Resistance	100%	80598	\$0.065	\$5,238.86

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
ASHP Air Source Heat Pump	200%	40299	0.065	\$2,619.43

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
GSHP Ground Source Heat Pump	300%	26866	0.065	\$1,746.29

		Total kWh Needed	Price / kWh Rates	Cost of Operation
ETS Electric Thermal Storage		41653	0.029	\$1,207.93

		Total kWh Needed	Price / kWh Rates	Cost of Operation
ERC Electric Radiant Ceiling		50532	0.031	\$1,566.48

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

Cost of Operation for Earth Storage System is actual. Comparison costs are an estimate.
Actual costs will vary depending upon rates and programs offered.