

# SmartRooms

Thermal Comfort Systems by *Therma-Ray*

## Radiant Ceiling - Case Study



### Overview

Location: Fredericton, New Brunswick - Canada

1800 Sq.Ft. Single-Level slab on grade with R19 walls and R38 Ceiling

Inside Design Temp. – (75°F) / Outside Design Temp. – (-10°) –

8,454 Actual Degree Days

Data Collection Dates = October 2001 - April 2002 / Energy Consumption = 12,435 Kwh

Electric Program Comparison - \$.031 per Kwh Rate on Dual Fuel Program

Total Cost to Operate - **\$ 385.49 @ \$.031/Kwh** / \$ 559.58 @ \$.045/Kwh / \$ 870.45 @ \$.07/Kwh

# Cost Comparison of Heating Sources

		Rates	
Name:	<b>Case Study - Radiant Ceiling</b>	Heating Oil:	\$3.01 per Gallon
Project:	<b>1800 Sq.Ft. - Slab On Grade Home Dual Fuel Program 70° Inside Design Temperature -10° Outside Design Temperature 8,454 Actual Degree Days</b>	LP Gas:	\$1.89 per Gallon
		Natural Gas:	\$1.39 per Therm
		ETS - Electricity:	\$0.029 per kWh
		Dual Fuel - Electricity:	\$0.031 per kWh
		Electric Resistance:	\$0.065 per kWh
		Yearly Heating Load :	82,735,000 BTU's

	Efficiency Rating	Total Gallons Needed	Price / Gallon	Cost of Operation
Heating Oil	60%	999	3.01	\$3,007.64
	70%	856	3.01	\$2,577.97
	80%	749	3.01	\$2,255.73

	Efficiency Rating	Total Gallons Needed	Price / Gallon	Cost of Operation
LP Gas	70%	1292	\$1.89	\$2,441.36
	80%	1130	\$1.89	\$2,136.19
	90%	1005	\$1.89	\$1,898.84

	Efficiency Rating	Total Therms Needed	Price / Therm	Cost of Operation
Natural Gas	70%	1182	\$1.39	\$1,642.88
	80%	1034	\$1.39	\$1,437.52
	90%	919	\$1.39	\$1,277.80

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
Electric Resistance	100%	24248	\$0.065	\$1,576.14

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
ASHP Air Source Heat Pump	200%	12124	0.065	\$788.07

	Efficiency Rating	Total kWh Needed	Price / kWh Rates	Cost of Operation
GSHP Ground Source Heat Pump	300%	8083	0.065	\$525.38

	Total kWh Needed	Price / kWh Rates	Cost of Operation
ETS Electric Thermal Storage	10589	0.029	\$307.07

	Total kWh Needed	Price / kWh Rates	Cost of Operation
ERC Electric Radiant Ceiling	12435	0.031	\$385.48

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

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