

Energy Audit Options

*The most efficient and thorough means of addressing your energy needs is to **treat the building as a whole.***

An energy audit will be necessary to understand all that's needed for a retrofit that makes sense, is manageable and advances your goals toward energy efficiency. This will become the basis from which savings and return on investment are projected.

Below are two energy audit options. The first is simple yet effective and accurate. The second is more detailed and will require much more information. Both allow us to enter the appropriate R-Values for **HeatSaver®** showing accurate results and payback period.

This is the information we would need to perform a basic analysis of your building. Also included is a sample run of a New York City apartment building.

1. Building age
2. Primary use
3. Location
4. Number of occupants and time of day occupied
5. Building footprint and orientation
6. Height, number of stories
7. Exterior wall characteristics - type of construction, length, height, insulation and exterior finish
8. Description of ceiling/roof construction including insulation type and thickness
9. Description of windows including type, age, size and location as relates to the exterior walls
10. Description of exterior doors including type, size and location
11. Description of the lowest floor i.e. slab on grade, unconditioned basement, crawl space, etc.
12. If not slab on grade any floor insulation which may be present i.e. fiberglass batting, foam, etc.

This model below assumes a 12 story apartment building in New York City, measuring 42 feet deep by 75 feet wide running on an east/west axis. The exterior building envelope is masonry with 138 single glazed windows approximately 36" x 60", no thermal breaks, equally spaced on the north and south faces.

At a projected sale price of approximately \$33,000 return on investment is realized in only 6 1/2 years. (\$5,100 per year.) At an annual savings of \$5,100 across the remaining 13 ½ years (projected **HeatSaver®** life span of 20 years), the **net gain would be \$68,850** not assuming increases in utility costs.

Prior to HeatSaver® Install

Primary Heating System

Space Name	Load (Btu/H)	Load (Btu/Hr-SqFt)	Distribution GPM	Ft of Baseboard
Flrs 1 – 12 Apts.	1,704,320	47	194	3,260
Flrs 1 – 12 Common	299,193	166	34	572

Required Heating Equipment Output Capacity: 2,203,899 Btu/hr

Available Heating Equipment Output Capacity: 3,960,000 Btu/hr

Total Flow: 220 GPM

Baseboard Capacity: 575 Btu/Hr-Ft

Heating Equipment Efficiency: 66%

Calculated Distribution Efficiency: 100%

Supply Temperature: 210 F

Temperature Drop: 20 F

Heating Safety Factory: 1.10

Distribution Safety Factor: 1.10

Cooling System

Space Name	Load (Btu/Hr)	Load (Btu/Hr-SqFt)	Distribution GPM	Ft of Baseboard
Flrs 1 - 12 Apts.	836,069	23		
Flrs 1 - 12 Common	0	0		

Required Cooling Equipment Output Capacity: 920,744 Btu/hr

Available Cooling Equipment Output Capacity: 1,800,000 Btu/hr

Total Flow: 30,448 CFM

Cooling Equipment Efficiency: 9 SEER

Calculated Distribution Efficiency: 100%

Temperature Drop: 28 F

Cooling Safety Factory: 1.10

Distribution Safety Factor: 1.10

1. The room heating/cooling loads do not include the equipment and distribution safety factor and distribution losses.
2. The room distribution includes distribution safety factor.
3. The load on the room is the peak load for this room in a year.
4. Available equipment output capacity includes equipment efficiency.
5. Required equipment output capacity includes diversity, distribution losses and equipment safety factor.
6. Overall distribution CFM/GPM for heating/cooling includes equipment safety factor, distribution losses and diversity.
7. TREAT load sizing has been tested in minimize calculation time mode and results were compared to Manual J. TREAT heating and cooling loads proved to be slightly more conservative. Please use professional judgment in applying the results to sizing heating and cooling systems.

After HeatSaver® Install

Primary Heating System

Space Name	Load (Btu/Hr)	Load (Btu/Hr-SqFt)	Distribution GPM	Ft of Baseboard
Floors 1 - 12 Apts.	1,616,230	45	184	3,092
Floors 1 - 12 Common	264,404	147	30	506

Required Heating Equipment Output Capacity: 2,068,685 Btu/hr

Available Heating Equipment Output Capacity: 3,960,000 Btu/hr

Total Flow: 207 GPM

Baseboard Capacity: 575 Btu/Hr-Ft

Heating Equipment Efficiency: 66%

Calculated Distribution Efficiency: 100%

Supply Temperature: 210 F

Temperature Drop: 20 F

Heating Safety Factor: 1.10

Distribution Safety Factor: 1.10

Cooling System

Space Name	Load (Btu/Hr)	Load (Btu/Hr-SqFt)	Distribution GPM	Ft of Baseboard
Floors 1 - 12 Apts.	795,101	22		
Floors 1 - 12 Common	0	0		

Required Cooling Equipment Output Capacity: 875,641 Btu/hr

Available Cooling Equipment Output Capacity: 1,800,000 Btu/hr

Total Flow: 28,956 CFM

Cooling Equipment Efficiency: 9 SEER

Calculated Distribution Efficiency: 100%

Temperature Drop: 28 F

Cooling Safety Factor: 1.10

Distribution Safety Factor: 1.10

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3. The load on the room is the peak load for this room in a year.
4. Available equipment output capacity includes equipment efficiency.
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6. Overall distribution CFM/GPM for heating/cooling includes equipment safety factor, distribution losses and diversity.
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Summary

Evaluated Packages

Annual Savings	%	Payback	Cashflow			
Cost	MBTU	\$	Savings	Years	\$/Year	SIR

Install HeatSaver® Shades \$35,798 351.8 \$5,085 4% 7.0 \$1,933 2.81

Package Descriptions

Install HeatSaver® Shades

	Cost	Annual Savings MBTU	\$	Payback Years	Cashflow \$/Year	Imp. Life Years	SIR in Package
Install HeatSaver Shades	\$35,798	351.8	\$5,085	7.0	\$1,933	20	2.81
Total Package	\$35,798	351.8	\$5,085	7.0	\$1,933	N/A	2.81

Non Energy Benefits

- 1.Improved comfort.
- 2.Increased building value.
- 3.Extended life of heating/cooling plants.

[TREAT](#) was used for the analysis above.

Other, more detailed and thorough analyses are available, one of which is [Retroficiency](#).

Nearly eighty inputs are available. The more detailed information entered, the more accurate the report, recommendations and hence projected return on investment. Not all are necessary, and we can work with you to determine which of the proposed upgrades will give you the most value. We can coordinate with your preferred contractors or recommend others.

Retroficiency Inputs	
Building name:	Building name
Street 1:	123 Main St
City:	Boston
State:	MA
ZIP:	02118
Total building square footage:	1,600,000
Construction year:	1992
Use areas:	95% Office, 5% Data Center
Electric Availability and Rates	
Electricity (cents/kWh):	12.15
Electric Demand Rate (\$/kW):	9.86
Natural gas (\$/therm):	1.14
Geometry	
# of floors:	10
Floor to ceiling height (feet):	10
Floor to floor height (feet):	14
% of wall that is glass:	45.0%
Use area 1 Occupancy	
Occupied building occupants:	2500
Unoccupied building occupants:	150
Weekday:	6:00 AM - 7:00 PM
Saturday:	Unoccupied
Sunday:	Unoccupied
Roof	
Roof construction type:	Built up
Roof deck type:	Metal

We can work together to bring your energy expenses back in line.

Immediate utility savings. Reduced loads on expensive heating and cooling equipment. Client and/or tenant satisfaction. No more extreme temperature swings.

Contact [Peter](#) or [Stan](#) for more information.

**HeatSaver® Thermal Shades.
Serious Energy Conservation.**