

# Energy Audit Calculations

Heat Losses

## 1. Losses through the walls:

Total heat flow (Standard Heating Units) =  
 $1/R \times (\text{Degree Days}) \times 24 \text{ (hours/day)} \times (\text{square feet}) \div 100,000$

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 5000 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units (SHU)}$

## 2. Losses through the windows:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 5000 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

## 3. Losses through the ceiling:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 5000 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

## 4. Losses through the floor:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 5000 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

## 5. Losses through the exposed basement or crawl space area:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 5000 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

## Total Energy Losses:

Total Standard Heating Units = Loss through walls + Loss through windows + Loss through ceiling + Loss through floor + Loss through exposed basement or crawl space

Total =  $\underline{\hspace{1cm}} \text{ "1" } + \underline{\hspace{1cm}} \text{ "2" } + \underline{\hspace{1cm}} \text{ "3" } + \underline{\hspace{1cm}} \text{ "4" } + \underline{\hspace{1cm}} \text{ "5" } = \underline{\hspace{1cm}} \text{ SHU}$

## Cost of Standard Heating Unit:

Cost =  $\frac{100,000}{(\text{heating value of fuel}) \times (\text{furnace efficiency})} \times \text{price of fuel}$

## Total Cost of Energy:

Total SHU losses  $\underline{\hspace{1cm}}$  x Cost of SHU  $\underline{\hspace{1cm}}$

## Energy Audit Calculations

### Cooling Losses

#### 1. Losses through the walls:

Total heat flow (Standard Heating Units) =  
 $1/R \times (\text{Degree Days}) \times 24 \text{ (hours/day)} \times (\text{square feet}) \div 100,000$

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 1350 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units (SHU)}$

#### 2. Losses through the windows:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 1350 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

#### 3. Losses through the ceiling:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 1350 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

#### 4. Losses through the floor:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 1350 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

#### 5. Losses through the exposed basement or crawl space area:

Total Heat Flow =  $1/ \underline{\hspace{1cm}} \text{ "R" } \times 1350 \times 24 \times \underline{\hspace{1cm}} \text{ square feet} \div 100,000 =$   
 $\underline{\hspace{1cm}} \text{ Standard Heating Units}$

### Total Energy Losses:

Total Standard Heating Units = Loss through walls + Loss through windows + Loss through ceiling + Loss through floor + Loss through exposed basement or crawl space

Total =  $\underline{\hspace{1cm}} \text{ "1" } + \underline{\hspace{1cm}} \text{ "2" } + \underline{\hspace{1cm}} \text{ "3" } + \underline{\hspace{1cm}} \text{ "4" } + \underline{\hspace{1cm}} \text{ "5" } = \underline{\hspace{1cm}} \text{ SHU}$

### Cost of Standard Heating Unit:

Cost =  $\frac{100,000}{(\text{heating value of fuel}) \times (\text{furnace efficiency})} \times \text{price of fuel}$

### Total Cost of Energy:

Total SHU losses  $\underline{\hspace{1cm}}$  x Cost of SHU  $\underline{\hspace{1cm}}$