

## Household Heating and Cooling Utility Costs

Month	Gas/Oil/Wood		Electric (kWh)	
	Cost	Usage	Cost	Usage
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Annual Maintenance or Repairs				
<b>Total</b>				

**Note:** If you have a grid-tied alternative energy system, you need to record your actual usage and not cost. Your electric bill should show you the kilowatt hours (kWh) or BTU's (British thermal unit) that you *used* and *supplied* via your system.

**FYI:** *Different utilities measure usage in different ways.* The most common are: BTU and kWh. For heating and cooling the BTUs are then calculated to determine the actual kWh associated to each energy type used, so we can compare apples to apples. The table below shows you those conversions for the most common heating and cooling fuels.

Energy Source	Quantity	BTUs (British thermal unit)	kWh (kilowatt hour)
Coal	1 pound	13,000	3.8
Natural Gas	1,000 cubic foot	1,000,021	229
Oil	1 gallon	138,095	40.5
Propane	1 gallon	91,500	26.8
Wood	1 pound	6,401	1.9

Room: \_\_\_\_\_

**Size or Footage of Room**

	Length	Width	Height
Room itself			
Closet 1			
Closet 2			

Calculate the Square & Cubic Footage of the room, including closets

	Square Feet (length x width)	Cubic Feet (length x width x height)
Room		
Closet 1		
Closet 2		
<b>Total</b>		

**Usage**

How often is this room used? (# times year (Do NOT list cleaning/maintenance))	How much Time (hours) are spent in this room during that usage?	Doing What? (Do NOT list cleaning/maintenance)
<b>Total</b>		

**Cleaning/Maintenance**

How often must this room be cleaned/maintained? (# times year)	How much Time is spent performing this cleaning/maintaining? (# hours per year)	Doing What Kind of cleaning/maintenance?	What Does it Cost to do this cleaning/maintenance? (\$ per year)
<b>Total</b>			

**How do you feel about the room?**

Likes	Dislikes

**Note:** When measuring for footage remember to measure from wall itself to the wall and NOT to the built-in.

**Comments:**



## Calculating Annual Cost Per Cubic Foot

### Heating/Cooling Utilities

Please note that all utilities have various taxes, tariffs and or levys that are applied to the bill. Some are fixed, some are based on usage. If the utility is basing these fees on usage – this usage can be either one way (consumption of energy only) or two-way (consumption and generation). These fees are always tacked onto the bill, are NOT included in the cost per unit and are generally itemized.

All the cost per foot, cost per unit and usage calculations discussed are based on the total dollar amount of the bill, which includes these various fees.

Also keep in mind that utility rates can vary from month to month and most definitely from year to year; so any cost calculation is just a 'snapshot' in time or at best, an educated estimate. IE: These are not figures that can be carved in stone.

If you are getting all your heating and cooling energy from the grid, these calculations are rather simple.

- Take the total amount paid of 12 months of utility bills and divide it by the Total Cubic Footage of the house, to equal the Heating/cooling Cost per Cubic Foot.
- Take the total units of energy consumed of 12 months of utility bills and divide it by the Total Cubic Footage to equal the Heating/cooling Units per Cubic Foot.

If you have a grid-tied alternative energy system, this is a bit more tricky and for several reasons.

- Grid-tied systems will operate differently based on the utility company in use, state laws and the alternative system itself.
- With most utility companies if the grid goes down, so does the feed from the alternative energy system – unless – the consumer specifically states at installation that they want their alternative energy available during a grid-down situation (means you have a transfer switch either manual or automatic).
- Utilities generally have the alternative system feed directly to the grid – unless – the consumer has a battery bank. Without the battery bank the grid tied alternative energy system is not connected to the structure. IE: The alternative system feeds directly to the grid and the structure pulls from the grid for energy. This is to avoid the need for a two-way and or second meter.
- Some alternative systems feed the battery bank and then send excess to the grid, and if the alternative system is not feeding the battery bank, the battery bank will pull from the grid as needed. In this case the structure always pulls from the battery bank and not the grid or alternative energy generator.
- Taxes, tariffs and or levys and fees may be fixed rate or based on usage. Usage can be one-way (consumption only) or two-way (consumption and generation).

Calculating Usage If you have a grid-tied alternative system: Your utility bill should still show the unit amounts you have provided to the grid and the unit amounts you have pulled from the grid and many will then give you the net value of the two.

So if you provide 100 kWh per month and use 25 kWh per month your net value is 75 kWh that is then paid to you.

To find the estimated cost per unit even though you did not have to pay anything; divide the amount paid to you by the excess kWh you provided.

In this example that would be; \$ amount of refund, divided by 75 kWh, equals the estimated cost per unit of energy.

Which you would then multiply this Estimated Cost per Unit of Energy by the 25 kWh you actually consumed that month to equal the Estimated Cost for that month.

Thusly the reverse is true: If you provide 50 kWh per month and use 70 kWh per month, the net value is that *you pay the utility* for the additional 20 kWh you consumed over the amount you generated.

To find the estimated cost per unit when you generated less than you utilized; divide the amount you paid by the excess kWh consumed.

In this example that would be; \$ amount you paid, divided by the 20 kWh you consumed, equals the estimated cost per unit of energy.

Which you would then multiply this Estimated Cost per Unit of Energy by the Total kWh utilized (70 kWh) that month to equal the total Estimated Cost for that month.

Add together the Monthly Estimated Costs per energy type to get the Annual Estimated Cost;  
Add together the Usage amounts for each month to get the Estimated Annual Usage.

Now you can calculate your Estimated Cost and Usage per Cubic Foot by:

- Take the total amount paid of 12 months of utility bills and divide it by the Total Cubic Footage of the house, to equal the Heating/cooling Cost per Cubic Foot.
- Take the total units of energy consumed of 12 months of utility bills and divide it by the Total Cubic Footage to equal the Heating/cooling Units per Cubic Foot.

If you wish to do a Home Physical Inventory for insurance purposes, see *Resource List* at end of the "*Can you Afford your House Lifestyle*" main document.

**Total Utility Costs divided by Total Cubic Feet = Cost per Cubic Foot to heat and cool the house**

<b>Annual Utility Cost</b>	<b>Divided by</b> /	<b>Total Cubic Feet</b>	<b>Equals</b> =	<b>Estimated Annual Utility Cost per Cubic Foot</b>
	<b>Divided by</b> /		<b>Equals</b> =	

**Total Utility Usage divided by Total Cubic Feet = Estimated Energy Units needed per Cubic Foot to heat and cool the house**

<b>Annual Utility Usage</b>	<b>Divided by</b> /	<b>Total Cubic Feet</b>	<b>Equals</b> =	<b>Estimated Annual Energy Units per Cubic Foot</b>
	<b>Divided by</b> /		<b>Equals</b> =	

**Cleaning/Maintaining**

**Total Clean/Maintenance Costs divided by Total Cubic Feet = Cost per Cubic Foot to clean and maintain the house**

<b>Annual Clean/Maintenance Cost</b>	<b>Divided by</b> /	<b>Total Cubic Feet</b>	<b>Equals</b> =	<b>Annual Clean/Maintenance Cost per Cubic Foot</b>
	<b>Divided by</b> /		<b>Equals</b> =	

Now to figure out how much it costs yearly to heat, cool, clean and maintain the interior space of your home per Cubic Foot do the following:

Add together the annual costs for heating/cooling and cleaning/maintenance; divide that by the Total Interior Cubic Footage of the home and you will get the Estimated Annual Cost for heating/cooling and cleaning/maintenance Per Cubic Foot.

**(Total Utility Costs plus Total Cleaning/Maintenance Costs) divided by Total Cubic Feet = Cost per Cubic Foot to heat/cool/clean/maintain the house)**

(Annual Utility Cost	Plus +	Annual Clean/Maintenance Cost)	Divided by /	Total Cubic Feet	Equals =	Annual Cost of Utility & Clean/Maintenance Per Cubic Foot
(	Plus +	)	Divided by /		Equals =	

To find out what it costs to heat/cool/clean/maintain a Particular Room:

**(Annual Estimated Cost of Utility & Clean/Maintenance per cubic foot, times the specific room's cubic feet = Estimated Annual Cost for Utility & Clean/Maintenance for that specific room)**

Annual Cost of Utility & Clean/Maintenance Per Cubic Foot	Times *	Room's Cubic Feet	Equals =	Estimated Annual Cost of Utility & Clean/Maintenance for this Particular Room
	Times *		Equals =	

Repeat this process for Utility/Usage Estimations for an individual room.