Heating Your Home With Wood

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Efficiently heat your home

These days, more people are heating their homes with wood. This information will help you estimate heating costs and show you how to get the most heat from your wood.

Why wood?

Wood heat is often not the cheapest heat source and it requires more work. It is less convenient than heating with fuels fed automatically. Wood is dirty and requires more planning to use. Wood burning systems require more maintenance. However, if the cost of wood is low enough, you will save money over other methods. Then, too, you may also enjoy the warm fire and the feeling of self-sufficiency brought on by providing the source of your warmth. For those who enjoy the work, cutting, splitting and stacking can be a pleasant form of exercise.

Cost comparisons between different woods and between wood and other fuels can easily be done using the steps in this guide. These steps assume you purchase your firewood and do not include installation costs or costs of improving the efficiency of an existing heating system.

Comparing costs of heat

To compare heating costs, you must convert costs of different fuels to cost per unit/heat. Cords of wood, gallons of oil, kilowatt hours of electricity, therms of natural gas and cubic feet of liquid propane gas must be converted to common heat content unit for comparison.

A British Thermal Unit, or BTU, is the amount of heat energy needed to raise the temperature of one pound of water by one degree F. This is the standard measurement used to calculate the amount of energy that a fuel, such as wood, has, as well as the amount of output of any heat generating device.

The kilowatt hour and the thermal are precise quantities of energy. The volume of heat in a cord of wood can vary considerably and the potential heat in a cubic foot of wood is different for different species.

The heating value of wood, and the type of stove used, makes wood heating calculations less precise than other fuel sources.

Why wood heat value varies

The ratio between the chemical components of wood (lignin, cellulose and extractives) makes wood heat values vary by as much as 20 percent. Wood cell walls, made of lignin and cellulose, have a heating potential of about 8,500 BTU per pound, depending on the species. Extractives (resin and oils that give wood color, decay resistance and odor) have a heat contact similar to that of lignin. Bark has a higher heat value than most wood.

In addition to the ratios of chemical and wood components, the dry weight per wood volume (wood density) is even more important.

California fuel woods weigh from 22 to 50 pounds per cubic foot. California law requires that firewood be sold by the stacked cord, well stowed and packed. A cord is a volume of 128 cubic feet in a stack 4 feet wide by 8 feet long by 4 feet high California Administrative Code Title 4, Ch. 8 (2) 1, Sec.2892).

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Approximate Heat Content Million/BTU	
Alder	15.7
Almond	32.9
Apple	27.5
Apricot	28.3
Avocado	20.7
CEDAR:	
Incense	16.0
Port Orford	17.6
Cherry	27.0
Chinkapin	18.9
Citrus	33.8
Cottonwood	14.0
Cypress, Monterey	19.3
Douglas-fir	21.5
Elm	20.7
EUCALYPTUS:	
Blue gum	28.0
Lemon scented gum	30.6
Mountain gum	24.3
Red gum	30.6
Rose gum	27.5
Fig	23.3
FIR:	
Grand	15.2
Red	16.1
White	15.7
LAUREL:	
Bay	23.3
California	23.3
Myrtle (Oregon)	23.3
Pepperwood	23.3
Madrone	24.8
Mahogany, mountain	39.8
Manzanita	32.0
Maple	19.6
OAK:	
Black	22.6
Blue	38.2
Canyon live	31.7
Coast live	28.5
Tanoak	26.1
White	28.2
Olive	37.3
Peach	32.5
Pear	32.0
PINE:	
Knobecone	20.5
Grey/ Bull	17.2
Lodgepole	17.3
Monterey	22.0
Ponderosa	18.3
Sugar	16.2
Plum	25.6
Redwood	18.5
WALNUT:	
English	22.5
Black	23.5

*Wood specific gravity and heat value are both necessary for calculation of fuel value. Both have been determined for most woods but data were estimated for a few uncommon species, based on local laboratory experiences.

Which Wood Is The Better Buy?

When different woods are available, a value comparison can be made using appropriate figures from the table. Follow these steps to find out which of your choices is the better buy:

1) Obtain from the table the heat value per cord of wood for each of the woods you want to compare.
2) Divide the cost you pay for a cord of wood by the heat value per cord. The answer is the cost of a million BTUs of heat for that species.
3) Compare the costs for the species. The cheapest cost per million BTUs is the best buy.

Example (not actual price): If black oak at $130/cord and incense cedar at $120/cord are both available and assuming both cords are dry, which is the better buy? To get the cost per million BTUs, divide the cost per cord of each wood by its heat per cord from the table.

- **Black Oak:** $130/cord divided by 22.6 million BTUs/cord equals $5.75/million BTUs.
- **Incense Cedar:** $120/cord divided by 16.0 million BTUs/cord equals $7.50/million BTUs.

If you have any questions about the material in this guide, please contact us:

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