In Michigan The Case for Wood as a Home Heating Fuel
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Henry A. Huber, Forestry
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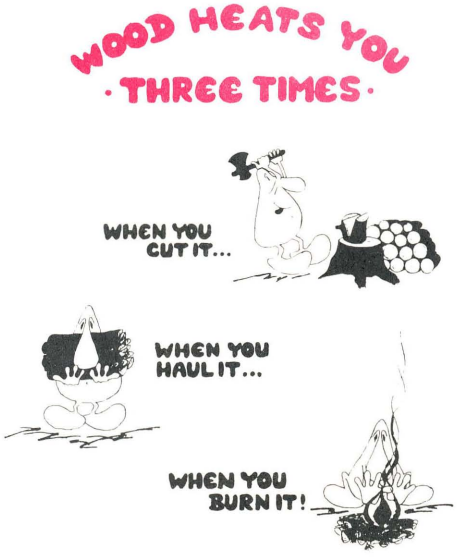
In Michigan —

The Case for Wood as a Home Heating Fuel

By Henry A. Huber, Extension Specialist in Forestry



Is there enough wood for heating?

The answer, of course, depends on how much you need, how much you can pay and where you live. It is estimated that two-thirds of the homes outside the 10 largest cities of Michigan could be heated entirely with wood fuel on a continuing basis. This could be done by using trees that are defective or diseased (cull trees) and "trim" from harvested trees not used for manufacturing other products such as furniture or paper pulp. The estimate is based on using only 10 percent of the available cull trees each year.

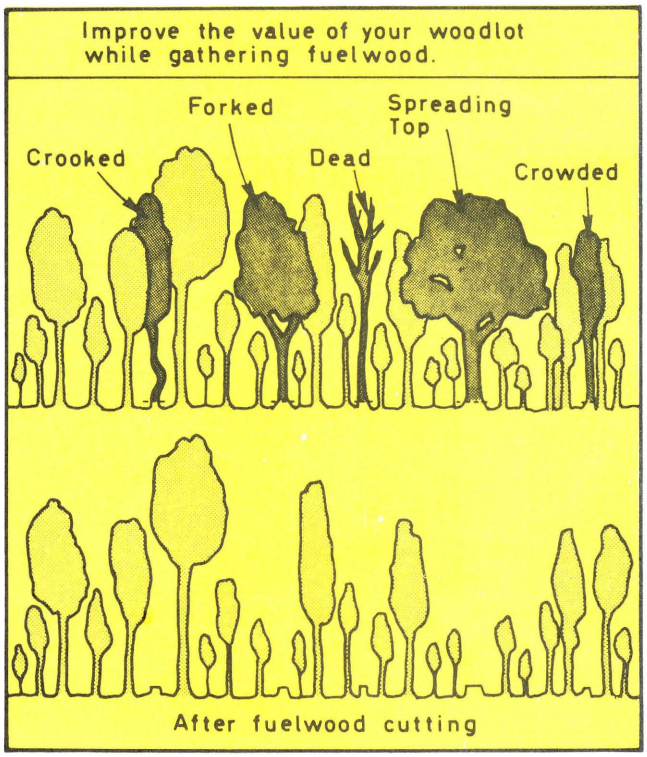
More likely, the majority of home owners will use wood as a supplementary fuel. The key is their location, and their willingness and ability to work. It has been said that "Wood heats you three times: once when you cut it, once when you haul it, and once when you burn it."

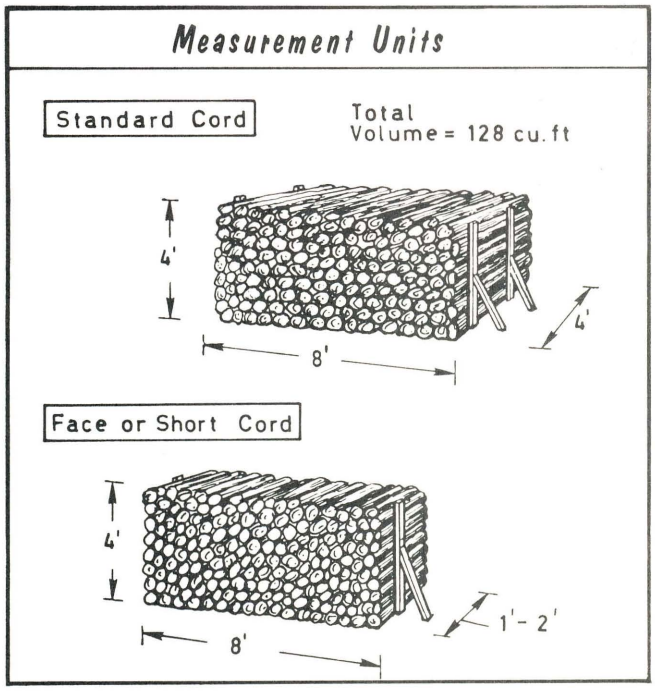
With the current high prices of firewood in cities, it is questionable whether it is economically sound, even with good heating equipment, to buy wood on a face cord basis and use it as a heating fuel. However, if you are willing and able to invest some time and energy in cutting and hauling, and if you have local accessibility to free or low-cost wood, then it may be a good investment.

There is enough wood for heating homes in Michigan if we use it only for home heating and consider only the wood that is cull or reject from other uses. However, with the emphasis on the use of wood, home heating may have to compete with industrial heating and an increase in manufacturing wood products. After World War II in Europe, wood was in such great demand that even sticks and twigs were picked up for heating fuel.

Is home heating with wood economical?

Figures 1-4 compare the cost of four common heating fuels. Figure 1 shows the heat equivalent (BTU) of four different home fuels. Figure 2 shows costs of different





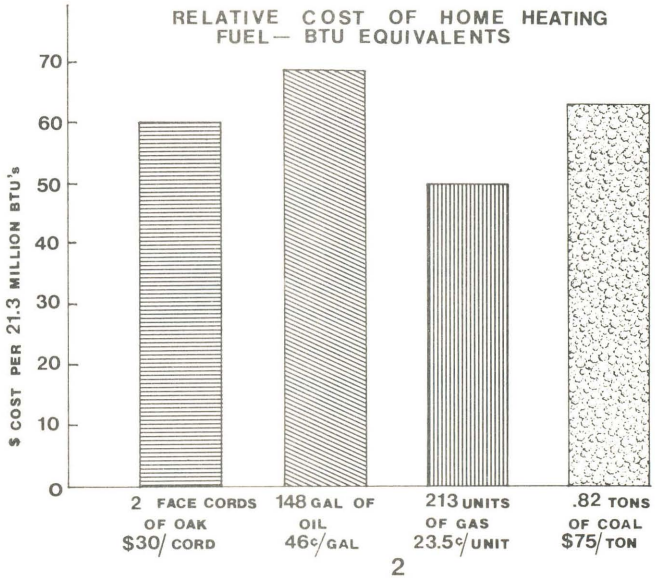
fuels for equal BTUs. Figure 3 shows the approximate burning efficiency of different fuels in homes and Figure 4 the relative costs at the indicated prices. These figures illustrate that natural gas at today's prices is the most economical fuel and wood at $30 a face cord cannot compete; but, the future of gas at this price relative to wood is in question. If the prices change, the values change proportionately. However, even based on today's prices, wood is economical if we can do a portion of the work in gathering and preparing it.

How do I install and operate my stove?

The safety aspects of installing and using a wood burning stove are very important, and various agencies can help. First of all, check with your insurance company before installing a stove. They are in a position to insure you and should have some good information on stoves.

Second, the building code enforcement people in Michigan have established codes for installation of all types of structures. Contact the code or building inspector. They can be helpful and are familiar with this type of problem.

A third possibility for safety consultation is the State Fire Marshal or your local fire department. It is impor-



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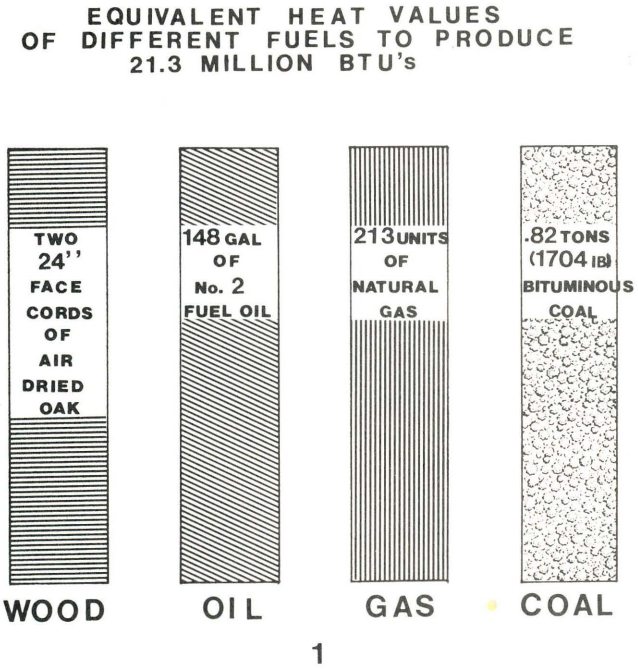

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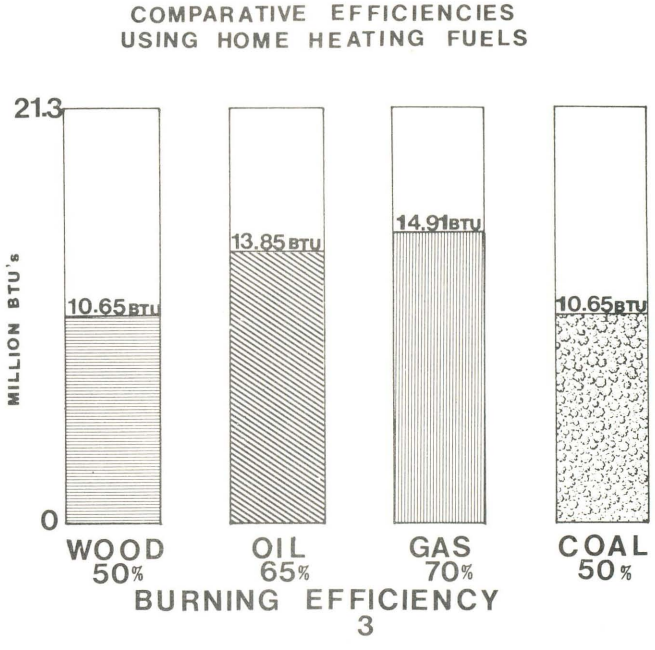

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tant that your wood heating device be correctly installed and safely operated.

What about care and maintenance?

This affects safety. One of the problems of wood burning is that the wood gives off creosote or a combination of condensation gases from the wood and moisture mixed together—particularly in cold chimneys or outside chimneys or where there are long distances for the gases to travel and become cooled. They condense on the chimney along with the creosote or partly combusted wood material and can ultimately close off the chimney and cause a fire. Your chimney should be periodically inspected and cleaned as necessary.

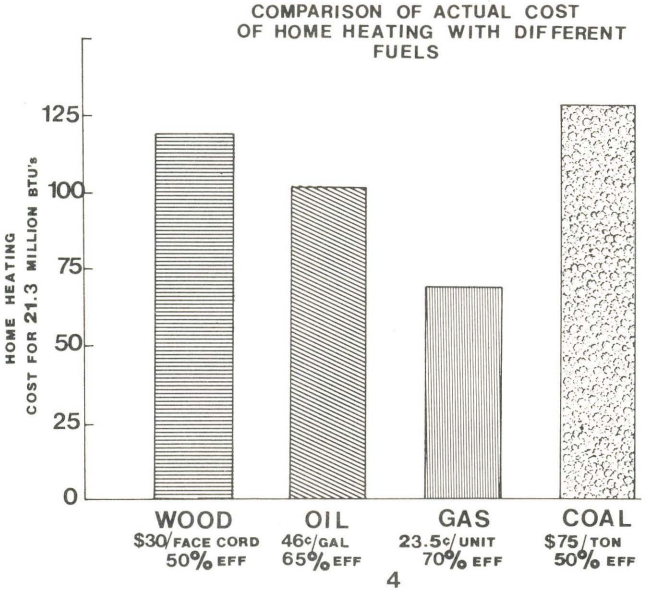
What about the future?

Until about 80 years ago most of our homes were heated with wood. Now, there is a definite trend back to wood as a fuel, although it takes much less effort to get a supply today than it did for our great-grandfathers. We have available to us pick-up trucks, chain saws and improved stoves that operate efficiently for a long period of time.

In the future, wood will probably be used as a home heating fuel only on a limited basis but will still make an important contribution toward solving our energy crisis.

How and where do I get firewood?

The answer to this depends on the amount of wood needed and the type and size of your home, the severity of the winter, etc. A pound of dry wood provides about 8,000 BTUs. However, most wood is not dry; it contains moisture, and necessary BTUs are required not only to evaporate the moisture but to take care of its cooling effect in burning. Consequently, more and more wood is needed as moisture content increases. In Figures 1 through 4 an assumption of 20 percent moisture content (the moisture in well, air-dried wood) was used at 5,700 BTUs per pound, or a loss of 30 percent for moisture.



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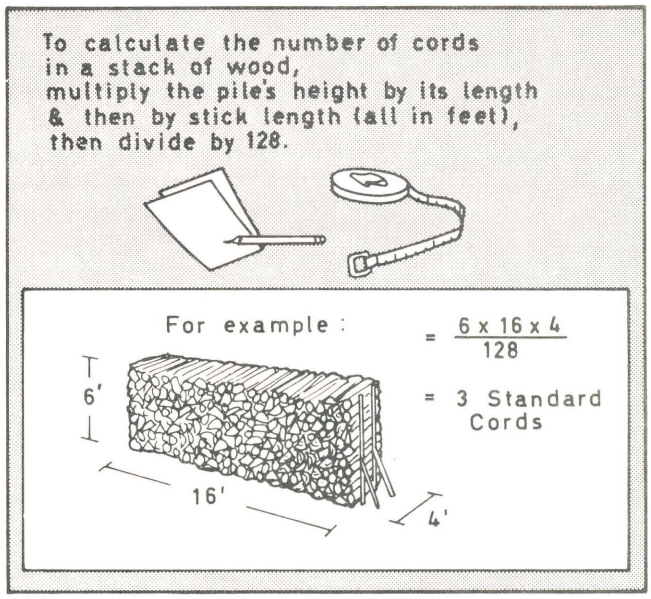


How much wood is necessary? For an average home and winter, 10 to 20 face cords of wood would be needed for the entire heating needs. The exact amount depends on type and size of house, location, insulation and type of wood-burning equipment. As a partial heating supplement, depending upon how much wood is used, it could be much less. Assuming you don't use the growing stock except to remove the cull trees and overcrowding, between 15 and 30 acres of woodlot are needed to supply your home for its entire heating needs on a sustained basis. (There are many things that make this a very difficult question to answer precisely, so these are approximations.)

For those who do not own, or have access to woodlots, both the state and national forests issue permits for cutting wood. Currently they are free, but this may change in the future. Remember, permits are necessary before you can cut wood in both national and state forests. Township or county forests are another possibility. Even tree removals by the city forestry department are made available to the public. Again, all of this must be done with permission.

What kind of wood is best?

The kind of wood is really not so important. Some woods are preferred over others for various reasons, mostly because of their high density and their ability to split and dry quicker than others. Some woods with very low density are bulky, and you need a greater volume for the same heat. If you are purchasing wood by volume, pick the "heaviest" woods, such as oak,

Table 1. Quality Characteristics of Commonly Burned Woods

Species	Easy to Split	Ease of Starting	Heavy Smoke	Sparks	Coaling Qualities
Apple		poor	no	few	excellent
Ash	yes	fair	no	few	good
Beech	no	poor	no	few	good
Birch (white)	yes	good	no	moderate	good
Cherry	yes	poor	no	few	excellent
Cedar	yes	excellent	yes	many	poor
Elm	no	fair	medium	very few	good
Hemlock	yes	good	medium	many	poor
Hickory	yes	fair	no	moderate	excellent
Locusts (black)	no	poor	no	very few	excellent
Maple (sugar)	yes	poor	no	few	excellent
Oak (red)	yes	poor	no	few	excellent
Pine(white)	yes	excellent	medium	moderate	poor
Spruce (Norway)	no	good	yes	moderate	poor
Willow	yes	fair	no	few	poor

hickory, beech and hard maple, but these are also more valuable woods for wood products. The resinous woods (pine, for example) can cause creosote in the chimney and are not preferred for stove fuel.

All wood should be cut to the right length, split to allow fast drying and stacked where the air can circulate around it. There is very little drying in Michigan during the winter so most of the wood should be split and left outside at least one summer season. If the top of the stack is covered to protect it from rain and snow, it will dry faster. But it still should have air around it.

What kind of a wood stove is best?

Every wood stove is different. Some have good features; some have bad. Since the needs of people vary, it is similar to asking what kind of automobile to buy. It depends on your needs and your pocketbook.

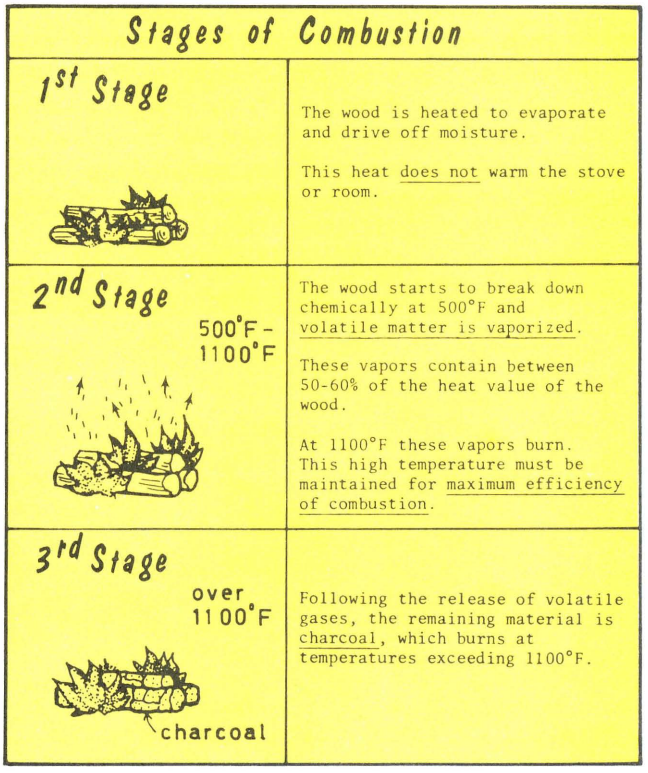
The least efficient wood burning occurs in **fireplaces** where very little useful heat is produced because most of the heat is lost up the chimney. In fact, the net fuel efficiency of the average fireplace is almost negligible. In the days when we had lots of energy, fireplaces were designed mainly for aesthetic appeal rather than to produce heat. Many of us still have fireplaces that were built without heating as a consideration, so improving their heat efficiency is a challenge. The fireplace can be made more efficient with a blower system or internal heat collector or some type of heat exchange system.

The next step toward heat efficiency from wood is some type of **box stove**. A box stove also does not control the air that goes into it, and when the wood is put in, it burns quite rapidly at first, and the stove requires restoking quite frequently. However, the efficiency of a box stove should be between 20 and 30 percent, and this is a considerable improvement over the old-fashioned fireplace.

An **airtight type** of stove is very efficient, sometimes 50 percent or slightly higher, based on the available BTUs in the fuel that is used. This type controls air intake and can be regulated almost perfectly with a few adjustments—or even automatically with a thermostat that allows more air as the temperature goes down and closes the air flow to the fuel when the temperature rises. This type of stove uses wood efficiently and minimizes the amount required. It also will burn longer without restoking.

The price of stoves varies with the quality, size and manufacturer. In the future, there will be a number of new types of stoves—some of them very good and some of them not so good. After determining your needs, examine each type carefully before you buy. Know your needs and the amount of heat that will be required.

Safety is important in the purchase of a wood stove. If the stove is not well constructed, be cautious about purchasing it at any price.



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