



UI Extension Forestry Information Series

Firewood Economics

Don Hanley

“How much money can I pay for wood and still save on my utility bills?”; “If I gather wood myself from a national forest here in Idaho, how far can I drive and save money?”

This publication shows you how to answer both questions. You can determine if the wood you are burning in your “traditional, open-faced fireplace” is costing you money. You can also determine if a draft-controlled wood stove will save you money.

By following the steps outlined, you can calculate your existing costs. You will need a small calculator, your highest utility bill from the past heating season and a pencil.

STEP 1 – Determine the cost of heat from your present system:

Take your utility bill and divide the total amount paid by the amount used. This should include any fixed monthly charges. These costs/unit are normally expressed as:

\$/gallon for heating oil

\$/therm for natural gas

\$/KWH for electricity

\$/gallon for propane

\$/ton for coal

My cost/unit is _____

For example, an electric home uses 1,780 KWH for a cost of \$53.40.

$$\text{Thus } \frac{\$53.40}{1,780 \text{ KWH}} = \$0.03 \text{ a KWH}$$

STEP 2 – Convert Step 1 costs to costs per 1,000 BTU (British Thermal Unit). These costs are expressed in dollars:

Select an alternative below. If you heat with:

oil _____ ÷ 103.875 = \$ _____
(cost/unit from Step 1)

natural gas _____ ÷ 80.0 = \$ _____
(cost/unit from Step 1)

electricity _____ ÷ 3.413 = \$ _____
(cost/unit from Step 1)

propane _____ ÷ 73.20 = \$ _____
(cost/unit from Step 1)

coal _____ ÷ 15,000 = \$ _____
(cost/unit from Step 1)

For example, electricity:

$$0.03 \div 3.413 = \$0.0088/1,000 \text{ BTU}$$

(rounded to 4 digits)

STEP 3 – Find the heat yield of the wood you burn:

The heat yield is simply the amount of heat that you can actually capture in your home. It is expressed as 1,000 BTU/cord. Select the species of wood that you most commonly burn and the type of wood burning unit you use. Multiply the **gross heat** (Table 1) times the **efficiency** (Table 2).

$$\text{Heat yield} = \frac{\text{gross heat}}{1,000} \times \text{efficiency} = \text{_____}$$

Variable costs

Gasoline (3/4 gal/cord)	_____
Fuel mix (3 oz/cord)	+ _____
Bar oil (6oz/cord)	+ _____
Subtotal	= (V) _____

For example,	
gasoline	\$1.00
fuel mix	+ .60
bar oil	+ .40
	<u>\$2.00/cord</u>

Total chain saw costs

Fixed costs/cord (subtotal F)	_____
Variable costs/cord (subtotal V)	+ _____
Total	= _____

For example,	
Fixed costs	\$5.83
Variable costs	+ <u>2.00</u>
	\$7.83

STEP 7 – Determine the total cost/cord:

Wood Stove	_____ (Step 5)
Chain saw	+ _____ (Step 6)
Wood cutting permit	
Cost/cord (if any)	+ _____
Total	= _____

For example,	
Wood stove	\$16.67/cord
Chain saw	+ 7.83/cord
Wood cutters permit	+ <u>.50/cord</u>
Total	\$25.00/cord

As you can see, obtaining your own wood from a “free” source will actually cost you more than \$20/cord plus transportation expenses.

STEP 8 – Determine your transportation costs:

Transportation costs are those costs associated with hauling a cord of wood from the forest to your home.

The amount will be figured on a cost per mile per cord hauled. You will need to know your total cost/mile to operate your truck (including depreciation, maintenance, and fuel) and its capacity. Assume the following (Table 3):

Table 3. Truck type/capacity (in cords).	
Truck type	Capacity in cords
Import size	4/10
1/2 T (1-foot side racks)	1/2 to 3/4
3/4 T (2-foot side racks)	3/4 to 1
1 T	1 to 1 1/4
2 T	2 to 2 1/4

A cord is a stack of wood that has a volume of 128 cubic feet (4x4x8 feet) and weighs approximately 2,500 pounds.

- (A) Total cost/mile _____ (\$/mile)
- (B) Truck capacity _____ (cords)

Thus, the total cost/mile/cord is found by dividing the cost/mile by the capacity (A ÷ B).

Transportation costs = _____ ÷ _____ = _____
 (A) (B)

For example,	
Total cost/mile (A)	= \$.30/mile
Capacity (B)	= 3/4 cord
Total cost/mile/cord = \$.30 ÷ 3/4 = \$.40/mile/cord	

STEP 9 – Determine your maximum round trip mileage (MRTM):

The maximum round trip mileage that you can drive to gather your own wood can be calculated by subtracting your total costs from the break-even value of the wood. If you then divide this difference, called maximum allowable transportation cost (MATC), by your cost per mile, the quotient is your maximum mileage.

MATC = _____ - _____ = _____
 BEV (Step 4) Total cost (Step 7)

MRTM = _____ ÷ _____ = _____
 MATC Transport cost
 (Step 9) (Step 8)

For example,

BEV	\$80.02
Total costs	- 25.00
MATC	= \$55.02
MRTM = $55.02 \div 0.40 = 137.5$ miles	

Reducing Transportation Costs. The only significant way to reduce the costs of gathering your own firewood is to minimize your transportation costs. Consider doing this:

- Use a large truck to haul your wood. The cost/cord/mile is lower on a large truck provided it is filled to capacity. You might want to scout out potential wood in a small truck before cutting.
- Keep spare parts for your chain saw. You can easily waste \$15 to \$20 for gas to drive to the

woods and back if your starter rope breaks on the first pull.

- Tow a trailer behind a two wheel drive $\frac{3}{4}$ ton (or larger) truck. You will be able to almost double your wood hauling capacity at a fraction of the cost.
- Do not overload your vehicle. Haul at capacity, but do not abuse your vehicle. Vehicle breakdowns are a sure way to very expensive firewood.
- Work and drive safely.
- Enjoy getting out into the forest for recreation and exercise. Remember, you are not paying yourself a wage for this work!

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