Thank you for your interest in writing to me about using a central wood-burning furnace to heat your house. Using firewood is probably the least expensive source of heat. See the worksheet on page four to estimate the savings from heating with wood. Using coal, wood pellets (from sawdust) or waste feed corn are also environmentally-sound fuels some of these furnaces can use. See page four for descriptions of corn and pellet furnaces.

I have listed only the highest quality central furnaces/boilers made. The most convenient furnaces are indoor models with a multifuel design. When the fire burns down, the backup gas or oil burners automatically start. You can also purchase most of these in wood-burning-only models. Unless you looked at the furnace, you would never know it switched from wood to gas or oil. If you are now heating your water with electricity, select a wood furnace with a hot water coil option for even more savings.

Consider getting an outdoor model if you plan to use wood exclusively for heat. These obviously reduce any fire hazards and you never have to haul wood indoors. Most outdoor wood furnaces heat water like a boiler because it is easier to super-insulate water pipes than hot air ducts. Just install a heat exchanger coil in your existing furnace blower and it will heat your home just like your existing furnace does. This way, you still have your old furnace for backup heat.

If you plan to install an indoor wood furnace, Charmaster makes a model with a fireplace built into one side (page four.) When not viewing the fireplace, you close safety doors.

Several typi-

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**Fuel Cost Comparison**

<table>
<thead>
<tr>
<th>Type</th>
<th>Fuel Cost</th>
<th>Efficiency</th>
<th>Price per Useful Thrm</th>
<th>Est. Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric</td>
<td>$.07/kWh</td>
<td>95%</td>
<td>2.15</td>
<td>$1,505.00</td>
</tr>
<tr>
<td>Propane</td>
<td>$.95/gal.</td>
<td>70%</td>
<td>1.49</td>
<td>$1,043.00</td>
</tr>
<tr>
<td>Oil Furnace</td>
<td>1.05/gal.</td>
<td>70%</td>
<td>1.08</td>
<td>$756.00</td>
</tr>
<tr>
<td>Heat Pump</td>
<td>.07/kWh</td>
<td>190%</td>
<td>1.07</td>
<td>$749.00</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>.76 therm</td>
<td>80%</td>
<td>0.95</td>
<td>$665.00</td>
</tr>
<tr>
<td>Pellet</td>
<td>135.00/ton</td>
<td>80%</td>
<td>0.94</td>
<td>$658.00</td>
</tr>
<tr>
<td>Corn</td>
<td>2.20/bushel</td>
<td>80%</td>
<td>0.55</td>
<td>$385.00</td>
</tr>
</tbody>
</table>

Estimated annual cost based on an 1800 sq. ft. home with annual heat demand of 700 therms. Useful therm pro-rates efficiency. 1 therm equals 100,000 Btu's. Fuel equivalents — Electric: 3415 Btu's/kWh • Propane: 90,600 Btu's/gal • Oil: 138,000 Btu's gal • Natural Gas: 1 million Btu's/MCF • Heat Pump 190% eff. average COP 1.9 @ 47°F • Pellets: 9,000 Btu's/lb • 8% MC • Corn: 9,000 Btu's/lb • 12% MC.

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**Selected Manufacturers of Wood, Coal or Multi-Fuel Boilers Furnaces**

**CENTRAL BOILER,** 20502 160th Street, Greenbush, MN 56726 - (800) 248-4681 (218) 782-2575 www.centralboiler.com

- model - Classic 4436 (indoor unit)
- firebox capacity - 18.3 cu. ft.
- features - The boiler is available in a variety of colors and it is designed to look like a storage building. There is urethane foam surrounding the water jacket. The cast iron door has a lifetime warranty that it won't warp. There is a night light on the unit. A domestic water-to-water heat exchanger can be added to heat all your hot water. There are larger models available.

**HARDY MFG. CO.,** 12345 Road 505, Philadelphia, MS 39350 - (800) 542-7395 (601) 656-6948 www.hardyheater.com

- model - H2 (outdoor unit)
- firebox capacity - 16 cu. ft.
- features - The unit is stainless steel construction inside and out. There are several heating coils available to heat hot water for household use or to heat your swimming pool. There is a 10 year warranty on the unit.

**HEATMOR, INC.,** Hwy. 11 E., Box 787, Warroad, MN 56763 - (800) 834-7552 (218) 386-2769 www.heatmor.com

- model - 100CSS (outdoor unit)
- firebox capacity - 9.0 cu. ft.
- features - These units have 10" fiberglass insulation and look like a colorful outdoor storage shed. The firebox is lined with firebrick. There is a water temperature gauge and the water temperature is adjustable. Accessories available — water to water or water to air heat exchangers and circulation pumps. These are stainless steel units with a 10-year warranty. See details on page three.

**HARMANSTOVES.COM,** 352 Mountain House Rd., Halifax, PA 17032 - (717) 362-9080 www.harmanstoves.com

- model - SF-160 Trident (boiler)
- firebox capacity - 13.5 cu. ft.
- features - This small model uses a spiral chamber and a cast iron grate system with external shaker lever. The SF-160 Trident is fitted for an optional domestic hot-water coil which can be fitted at any time. Fittings are also provided for an electric back-up package which includes two 4500 watt heating elements, a dual function aqua-stat and a control box. There is five-year warranty on the unit.

**HS TARM,** PO Box 285, Lyme, NH 03768 - (800) 782-9927 www.woodboilers.com

- model - two Excel 2000 models (indoor unit)
- firebox capacity - 4.0 cu. ft. • 6.6 cu. ft.
- features - These boilers use a gasification burning process for high efficiency. There are fully automatic controls that switch from wood to gas/oil whenever the wood fire burns out. A domestic hot water coil for household water can be used year round. There are ceramic bricks in the combustion chamber that have air injection slots built into them to provide the oxygen needed for complete combustion. There is a 20-year limited warranty. There are add-on models available.

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Please see page four for descriptions.
Selected Manufacturers of Wood, Coal or Multi-Fuel Forced-Air Furnaces

ALPHA AMERICAN CO., PO Box 20, Palisade, MN 56469 - (800) 358-0060 (218) 845-2224 www.yukon-eagle.com

model - Eagle I
blower cfm - 800 to 1,400
fuel - wood or coal / gas or oil

model - Eagle II
blower cfm - 1,200 to 1,800
fuel - wood or coal / gas or oil

model - Eagle III
blower cfm - 800 to 1,400
fuel - wood or coal / electric

model - SuperJack (add-on model)
blower cfm - uses existing blower
fuel - wood only

features - Several of the “Deluxe” models have a built-in washable air filter. A shaker grate kit is available to allow burning of coal. A “Hot-Tube” domestic hot water preheater kit that connects to the hot water tank is available. The fireplace in the “Super Line” models has an angled fire brick lining. There is a five-year warranty.

AMERICAN ENERGY SYS., 955 Industrial St. N.E., Pine City, MN 55063 - (800) 495-3196 (320) 587-6565 www.magnumfireplace.com

model - 521(usually add-on)
blower cfm - 1,780
fuel - wood or coal

model - Charmaster II oil or gas models
blower cfm - 1,780 or 2500
fuel - wood or coal / gas or oil

model - Embers (outdoor use)
blower cfm - 2500
fuel - wood

features - The “Charmaster II” is a wood/oil or gas combination furnace/fireplace. It has full brass-bound bi-fold doors with heat resistant glass. There is a steel door that contains the logs and fire when the fireplace is not used. The fireplace extension bolts on. You have your own choice of fireplace materials — brick, stone, etc. to blend into your home’s decor. There are wood only furnaces and an outdoor wood-fired hot water furnace available. See pages three and four for illustrations and details.

CHARMASTER, 2307 Highway No. 2 West, Grand Rapids, MN 55744 - (218) 326-6786 www.charmaster.com

model - Chalet oil or gas models
blower cfm - 1,780 or 2500
fuel - wood / gas or oil

model - Charmaster models
blower cfm - 1,780 or 2500
fuel - wood / gas or oil

model - Charmaster II oil or gas models
blower cfm - 1,780 or 2500
fuel - wood / gas or oil

model - Embers (outdoor use)
blower cfm - 2500
fuel - wood

features - The cabinet is fully insulated so it is cool to the touch. The fireplace is lined with firebrick. There are cast irongrates, stainless steel firebrick holders and a large scoop-type ash drawer.

model - Countryside
blower cfm - variable
fuel - corn or wood pellets

model - Magnum 4000
blower cfm - 1780
fuel - wood or coal

features - There is a two-stage thermostat which shows which fuel is being used. It controls both combustion chambers at separate temperature settings. The oil/gas fire comes on automatically if the wood fire dies down or does not maintain the temperature you set. (Electric model not self-ignitin). You can also ignite the fire with kindling. The furnaces have a 20-year limited warranty.

DAKA CORP., 955 Industrial St. N.E., Pine City, MN 55063 - (800) 884-3252 (320) 629-6737 www.dakacorp.com

model - 521(usually add-on)
blower cfm - 500 or optional 1580
fuel - wood or coal

features - Options and accessories include — heat exchange cabinet, hydronic baseboard heater, heat exchanger coil, circulating pump, and additional coils are available for swimming pools, hot tubs or other applications. The units are covered by a one-year warranty with a optional six-year warranty for an additional charge. Use during summer for hot water - only add wood twice a week.

HARMAN STOVE CO., 352 Mountain House Rd., Halifax, PA 17032 - (717) 362-9080 www.harmanstoves.com

model - PF 100 Pellet Pro
blower cfm - 1,000 • 1,400 optional
fuel - corn or wood pellets

model - SF 2600-A
blower cfm - 1,000
fuel - wood or coal / oil

features - The PF 100 can be installed as a stand alone hot air heating system or incorporated into existing hot air systems. A chimney is not required for venting. This direct vent system can also use outside air. A huge ash pan allows three to four tons of pellets to be burned before the ash pan needs to be emptied. When no heat is required the fire will go out, lighting again automatically if more heat is needed. The SF 2600-A triple fuel oil burner fires into a separate combustion chamber and goes through a 24-tube, triple-pass heat exchanger. With this system, the oil nozzle should not get clogged with coal dust or soot which can happen on some other designs. There is five-year warranty on on both units. See page four for illustration and details of the PF 100.

Selected Manufacturers of Wood, Coal or Multi-Fuel Boilers/Furnaces - cont’d.

TAYLOR MFG., PO Box 518, Elizabethtown, NC 28337 - (800) 545-2293 (910) 862-2576 www.taylormfg.com

model - T450MF (outdoor unit)
fuel - wood or coal / oil or gas
firebox capacity - 11.1 cu. ft.
log length - 32”
Btuh output - 115,000

model - 1750MF (outdoor unit)
fuel - wood or coal / oil or gas
firebox capacity - 12.5 cu. ft.
log length - 32”
Btuh output - 160,000

features - Options and accessories include — heat exchange cabinet, hydronic baseboard heater, heat exchanger coil, circulating pump, and additional coils are available for swimming pools, hot tubs or other applications. The units are covered by a one-year warranty with a optional six-year warranty for an additional charge. Use during summer for hot water - only add wood twice a week.
HAHSA CO., PO Box 112, Falls, PA 18615 - (800) 344-2472 (570) 388-6172 www.hahsa.com  
features - This is a "plans only" package to build a do-it-yourself outdoor wood furnace with easy to follow step-by-step instructions. The unit can be built completely from locally-purchased materials. The unit is approximately 8' x 10'.

JA-RAN ENTERPRISES INC., 3541 Babcock Rd., Lexington, MI 48450 - (810) 359-7985 www.ja-ran.com  
model - Superior model  fuel - corn or wood pellets  Btuh output - 100,000  hopper capacity - 12 bushel  log length - not applicable  features - The thermostat controls the fuel feed system to provide a constant temperature. It will shut down automatically if the fuel runs out. The burn pot is made of 60 pounds of cast iron. The hopper is mounted on the side of the furnace. It is a bottom-fed furnace so clinkers are not a problem. Rye and cherry pits can also be burned. There is a "double" model with a heat output of 200,000 Btuh. See page four for illustration and more design features.

L. B. BRUNK & SONS, INC., 10460 State Route 45, Salem, OH 44460 - (330) 332-0359 www.brunksmfg.com  
model - four Brunco models  fuel - wood or coal  Btuh output - 90,000 to 190,000  hopper capacity - 80 lbs.  log length - 24" - 25" - 30"  features - The firebox has shakable grates, a cast iron rear brick and it is lined with high temperature 1½" fire brick. The furnace has a wall thermostat control that maintains the heat output you desire. The baffle system is adjustable to help burn extra gasses and to reduce heat loss up the chimney.

PINNACLE PELLET, INC., 4252 Dog Prairie Rd., Quesnel, B.C., Canada, V2J-6K9 (800) 967-9777 www.pinnaclepellet.com  
model - S-F 6000 (outdoor use)  fuel - wood  Btuh output - 200,000  hopper capacity - 16 cu. ft.  log length - 30"  features - "GBU-130" has an optional coil for domestic hot water. "GBU-70" has a wall thermostat and a built-in pilot.

SURE-FLAME MFG., 245 Erie St., Huntington, IN 46750 - (219) 356-1905 no web site  
model - S-F 6000 (outdoor use)  fuel - wood  Btuh output - 200,000  hopper capacity - 16 cu. ft.  log length - 30"  features - The firebox has a five-year warranty. The fire is laid directly on the fire brick hearth. The ashes are removed easily through the loading doors. Depending on the type of fuel, you could get 12 hours or longer burn time.

U.S. STOVE CO., PO Box 151, S. Pittsburg, TN 37380 - (423) 837-2100  www.usstove.com  
model - Superior model  fuel - corn or wood pellets  Btuh output - 100,000  hopper capacity - 12 bushel  log length - not applicable  features - The thermostat controls the fuel feed system to provide a constant temperature. It will shut down automatically if the fuel runs out. The burn pot is made of 60 pounds of cast iron. The hopper is mounted on the side of the furnace. It is a bottom-fed furnace so clinkers are not a problem. Rye and cherry pits can also be burned. There is a "double" model with a heat output of 200,000 Btuh. See page four for illustration and more design features.

Early Fall — Late Spring Burning  
• Top heat exchanger damper open slightly  
• Controlled, even heat loss keeps chimney warm  
• Eliminates creosote  
• Small charcoal bed — small wood load

Cold Weather Burning  
• Top heat exchanger damper closed — all smoke must go down — highest efficiency  
• Charcoal production at peak, larger charcoal bed — larger wood load keeps chimney warm  
• Longer burn time — more heat from less wood — even heat  
• A warm home in the mornings

The Two-Pipe System by Charmaster  

Early Fall — Late Spring burning  

Cold weather burning requires a larger load of firewood and a larger bed of charcoal. Your wood furnace would be burning harder — thus producing more heat. The top heat exchanger damper can now be closed completely. Your chimney will be automatically warmer. Now your furnace is in its most efficient mode.
Wood Heat Evaluation Worksheet

1. Heating fuel you now use
2. Fuel unit (gal., cu. ft., etc.)
3. Number of Btu's per fuel unit - see Chart A
4. Number of fuel units you used last year
5. Money that you spent for this fuel
6. Potential Btu's you actually received (#3 x #4)
7. Efficiency of your heating system - see Chart B
8. Btu's you actually received (#6 x #7)
9. Percentage of the heat load you want from wood
10. Convert to percentage (#9 ÷ 100)
11. Type of wood you will burn
12. Cost of one cord of wood
13. Potential heat content in cord of wood - see Chart A
14. Number of cords containing enough heat to heat your home (#8 ÷ #13)
15. Number of cords to supply the heat you need (#14 x #10)
16. Type of wood-burning device you install
17. Efficiency rating of device - see Chart B
18. Number of cords you will need to buy (#15 ÷ #17)
19. Money you will spend on wood (#18 x #12)
20. Proportional cost of heat (#5 ÷ #10)
21. Annual savings from burning wood (#20 – #19)

Chart A - Heat Content per Fuel Unit

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Unit</th>
<th>Btu/Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>gallon</td>
<td>138,700</td>
</tr>
<tr>
<td>Kerosene</td>
<td>gallon</td>
<td>138,500</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>therm</td>
<td>100,000</td>
</tr>
<tr>
<td>Electricity</td>
<td>kwh</td>
<td>3,414</td>
</tr>
<tr>
<td>Hardwood</td>
<td>cu. ft.</td>
<td>1,025</td>
</tr>
<tr>
<td>Mixed Woods</td>
<td>cord</td>
<td>27,000,000</td>
</tr>
<tr>
<td>Soft Woods</td>
<td>cord</td>
<td>18,000,000</td>
</tr>
<tr>
<td>Propane</td>
<td>cu. ft.</td>
<td>2,500</td>
</tr>
<tr>
<td></td>
<td>gallon</td>
<td>91,000</td>
</tr>
<tr>
<td></td>
<td>pound</td>
<td>21,500</td>
</tr>
<tr>
<td>Coal</td>
<td>ton</td>
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Chart B - Heating System Efficiency

<table>
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<tr>
<th>Fuel</th>
<th>Heating Device</th>
<th>Efficiency</th>
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</thead>
<tbody>
<tr>
<td>Oil or Kerosene</td>
<td>New high efficiency</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td>Recently tuned with flue damper</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td>Without flue damper</td>
<td>.60</td>
</tr>
<tr>
<td></td>
<td>Average untuned</td>
<td>.50</td>
</tr>
<tr>
<td>Electricity</td>
<td>Resistance type</td>
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<td></td>
<td>Heat pump</td>
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<td>Natural Gas or Propane</td>
<td>New high efficiency</td>
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<tr>
<td></td>
<td>Good condition with stack damper</td>
<td>.80</td>
</tr>
<tr>
<td></td>
<td>Average condition</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td>Untuned</td>
<td>.60</td>
</tr>
<tr>
<td>Coal</td>
<td>High efficiency</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td>Good with flue damper</td>
<td>.60</td>
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<tr>
<td></td>
<td>Without flue damper</td>
<td>.55</td>
</tr>
<tr>
<td>Wood</td>
<td>High efficiency wood stove or furnace</td>
<td>.80</td>
</tr>
<tr>
<td></td>
<td>Standard wood stove</td>
<td>.60</td>
</tr>
</tbody>
</table>

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