

While wood heating is an extremely old practice, recent changes in technology have made this form of heating much more efficient. Wood heating is a form of biomass energy. Biomass refers to all of the organic material that comes from managing forests. This wood fuel includes: Cord wood, wood chips, wood pellets, as well as scrap wood.

Wood Boilers

- Wood boilers do exactly what the name suggests. They burn wood to boil water to provide both hot water and space heating.
- There are many kinds of wood boilers - some can burn cord wood (cut into 3'-4'ft lengths), wood chips or wood pellets etc.
- They can be set up in different ways as well. For example, if an owner adds a heat exchanger to their system, it will allow the boiler to be hooked up to an existing forced air system.
- Wood boilers are larger than most wood fuel systems, so they are likely to be located outside.
- They are capable of heating much larger spaces, making them ideal for businesses and public buildings.
- This extra space gives them the advantage of having room to store more fuel at one time.
- Some even have an auger system so they feed themselves.
- Having the boilers outside also removes the dangers of house fires or carbon monoxide poisoning.
- Outdoor wood boiler's efficiency ranges from 39% to 78% with the average outdoor wood boiler being 63% efficient .

Outdoor boilers can have a water jacket surrounding the furnace firebox and heat exchanger. Heated water is circulated to your home or building through insulated underground pipes - an efficient way to move heat over distances.



<http://biomassmagazine.com/articles/10263/epa-lists-efficiencies-of-qualified-outdoor-boilers#:~:text=On%20April%208%2C%20the%20EPA,pellet%20boilers%20is%2070%20percent>

Common Wood Stoves

- The most common wood heating appliance is the wood stove.
- Recent technology has improved safety features and efficiency, so they produce almost no smoke, minimal ash and require less firewood.
- It can be safely located in many areas of your home as long as the flue pipe can run straight up to the chimney.
- Ideally, a wood stove should be located on the main floor, in the centre of the building so heating is even.
- The wood stove's main drawback is they do not have an air exchange system so an open area house design is the best fit.
- A blower fan can be added to distribute heat throughout a home.
- Like all wood heaters, they require regular upkeep and cleaning to be efficient and safe.



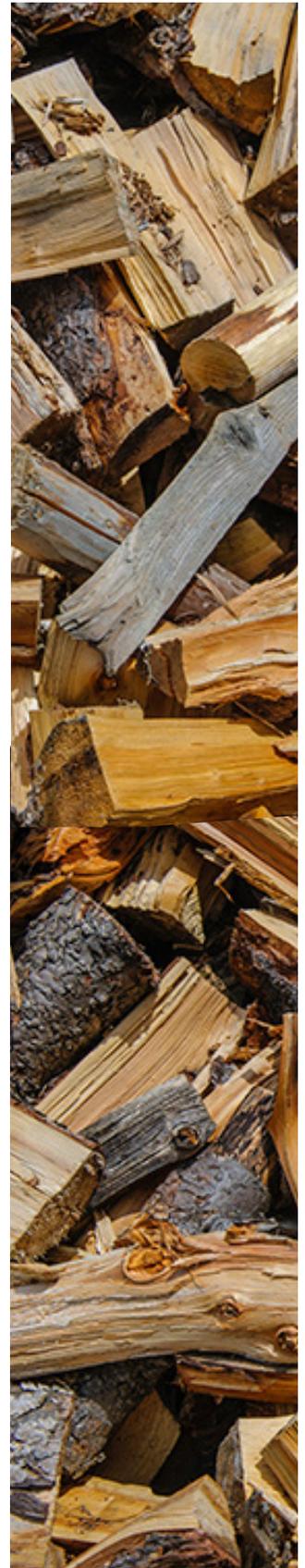
<https://www.mychimney.com/blog/7-reasons-invest-quality-wood-stove/>

Catalytic Stoves

- Catalytic stoves look similar to traditional wood stoves, however they have a second burning process where the smoke passes by a section of coated ceramic honeycomb where it ignites and burns again.
- This produces more heat and increases the efficiency of the stove.
- This produces a slower burn, making more heat with less fuel and less time loading your catalytic stove.



BlazeKing Chinook 30.2
<https://www.blazeking.com/products/wood-stoves/chinook-30/>



Conventional Open Fireplaces

- These are likely the first image that comes to mind. They are typically an open concept, usually surrounded by bricks or stone.
- These fireplaces do not heat a home effectively, in fact they use a home's preheated air and send it right up the chimney.
- They only produce heat for the small area just in front and will actually cause the rest of your home to cool down. This creates a below zero efficiency rate while adding pollutants to the air.
- Fireplaces will likely not burn all the wood you put into them.
- Installing technology to reduce pollutants from entering your home will typically end up reducing the efficiency as they restrict air flow into the fireplace. But hey, they sound and smell great!



unsplash.com

High-Efficiency Fireplaces

- Engineers have found ways to combine the good looks of a fireplace with the efficiency of wood stove.
- High-efficiency fireplaces are becoming as effective as advanced wood stoves - as high as 75%.
 - The firebox and heat exchanger are surrounded by an insulated sheet-metal casing.
 - A lumber or steel-stud frame is built and covered with drywall or other materials to enclose the sides and rear of the fireplace.
 - The enclosure can then be decorated with tile, brick or stone slices.
- These fireplaces provide heat to the room by drawing air through a grille (below the firebox) into the circulation chamber (between the firebox and casing), where it is heated.
- This heated air is directed back into the room either through another grille above the fireplace opening or through ducts.
- These new fireplaces, approved to CSA International or EPA performance standards, can provide efficient heat and look great, too.
- Their only real drawback is the complex installation, which you should leave to trained professionals.



Pellet Stoves

- Pellet stoves burn compacted pellets, usually made of wood or other organic material.
- Wood and other biomass wastes are dried, heated and compressed into 6 mm (1/4 in.) diameter and 25 mm (1 in.) long cylinders.
- This fuel arrives in bags and is poured into a hopper where an auger system slowly pulls pellets into the

burning chamber at a controlled rate, so the amount of air and fuel is just right for an efficient burn.

- This process results in lower greenhouse gas emissions when compared to traditional fireplaces.
- The downside is the auger and fan use multiple motors, using electricity, unlike most wood stoves.
- Also, pellets can be more expensive than traditional firewood and not always available in rural or remote areas.



Harman Allure50 Pellet Stove
<https://www.harmanstoves.com/products/allure50-pellet-stove.aspx>



Wood Heat vs Pellet Heat

- When choosing between a wood or a pellet stove there are many things to take into consideration.
- Generally, wood fuel gives off the hottest heat, provides a classic ambiance, low maintenance and gives the homeowner the opportunity to save money by harvesting their own fuel.
- Pellet stoves are much easier to load and easier to operate but require more maintenance and fuel may be harder to obtain in remote communities.

	Wood	Pellets
Environmental Impact	Low	Low
Heat Production	Excellent	Very Good
Safety	Safe	Very Safe
Requires Electricity?	No	Yes
Installation Flexibility	Good	Excellent
Cost or Affordability	Fair	Fair + higher fuel cost
Efficiency	Good (~70%)	Very Good (~83%)
Time and Effort to Fuel	High	Low
Maintenance Required	Low	High

Additional Resources

[Natural Resources Canada - Heating Equipment for Residential Use](#)

[Efficiency Nova Scotia - Homeowners guide to Wood Heating](#)

[Essential: Home and Garden: Pellet Vs Wood Stove](#)

[Wood Heat vs. Pellet Stove Comparison Guide](#)

[Solid Wood Bioheat Guide for Rural and Remote Communities in Ontario](#)