

Section 2 - Environmental Issues

Emissions - "If You Love This Planet..."

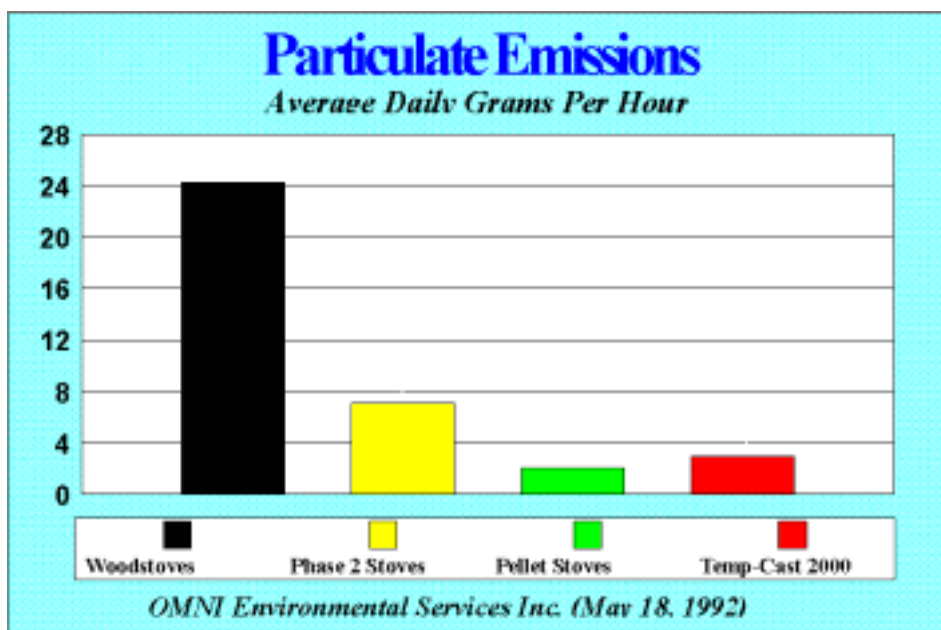
"Tomorrow's consumer will be concerned not only with how much energy his house consumes, but also how much environmental impact his particular form of energy has." (Ref. Masonry Heater Association News, Vol. 5, #2, reporting on articles in "Environmental Building News")

Similar legislation on control of wood smoke emissions is expected in Canada in 1993, modeled after the American E.P.A. standards. It is not unrealistic to predict similar restrictions and outright bans on stoves and fireplaces which cannot meet the new standards.

Not many would argue that we cannot continue to pollute the oceans and rivers

feeding the fire from above the fuel load. (See Fig. 8, pg. 9) This permits more complete combustion during the early stages of a fire, as the wood gases burn above the fuel as soon as they are released. The top down burn assists this, with the kindling placed on top of the main fuel load igniting quickly and promoting rapid gas combustion.

These innovations ensure that the vast majority of environmentally harmful gases, compounds and tars are burned in the firebox, creating heat, not pollution. The Temp-Cast 2000 fireplace, and other masonry stoves, have been tested for emissions, demonstrating that they are the cleanest burning wood stoves in existence.



Incomplete combustion of wood creates biologically harmful "particulate" emissions, visible as smoke. In the United States, the Environmental Protection Agency and individual states enforce the most stringent regulations on wood smoke emissions in the world. In many states, wood stoves and open fireplaces are being restricted or completely banned due to their inherent poor combustion and excessive emissions.

and the air we breathe and hope to live long and healthy lives. Ultimately, improving air quality and other essential elements of our environment will be a "grass roots" movement by people around the world doing a little to create a large impact.

Temp-Cast fireplaces use the latest burn technology which incorporates an **over-fired** combustion air delivery and **top-down burning** technique. The air comes through the door frame,

"A new, super low emissions category is now being implemented to cover appliances with emissions in the 1 to 2 gram per hour range. The masonry heaters tested fall into this category, which makes them belong to that rare class of wood heating systems that are acceptable for use even in the most polluted areas." (Ref. Paul E. Tiegs, Omni Environmental Services, reported by Masonry Heater News, Vol. 5, #2, 1992)

Heating your home or cottage with a Temp-Cast masonry heater is a responsible environmental decision that you can feel good about - for not adding

to the air pollution problem, and for using a renewable fuel that is intimately part of the natural ecology. In addition, Temp-Cast fireplaces are manufactured from 95% recycled and natural materials and therefore add very little to the environmental burden.

"Environmentally, masonry heaters evidently outshine all other wood burners and, perhaps every other heating system, save solar." (Ref. Dirk Thomas, The Harrowsmith Country Life Guide to Wood Heat, 1992)

PM-10

Recently, legislators and consumers have become increasingly concerned with PM-10 wood smoke emissions - those particles which are 10 microns or less in size, and which can be easily absorbed into the bloodstream through the lungs. Researchers have therefore been testing more rigorously for these specific emissions in the last few years.

Masonry heaters as a group have been shown in field tests to emit an average of 2.8 gm/kg of PM-10 emissions, compared with an average of 7.3 gm/kg for the best Phase II woodstoves.

(Ref. Barnett, S.G., "Summary Report of the In-Home Emissions and Efficiency Performance of Five Commercially Available Masonry Heaters", the

Masonry Heater Association, May 1992.)

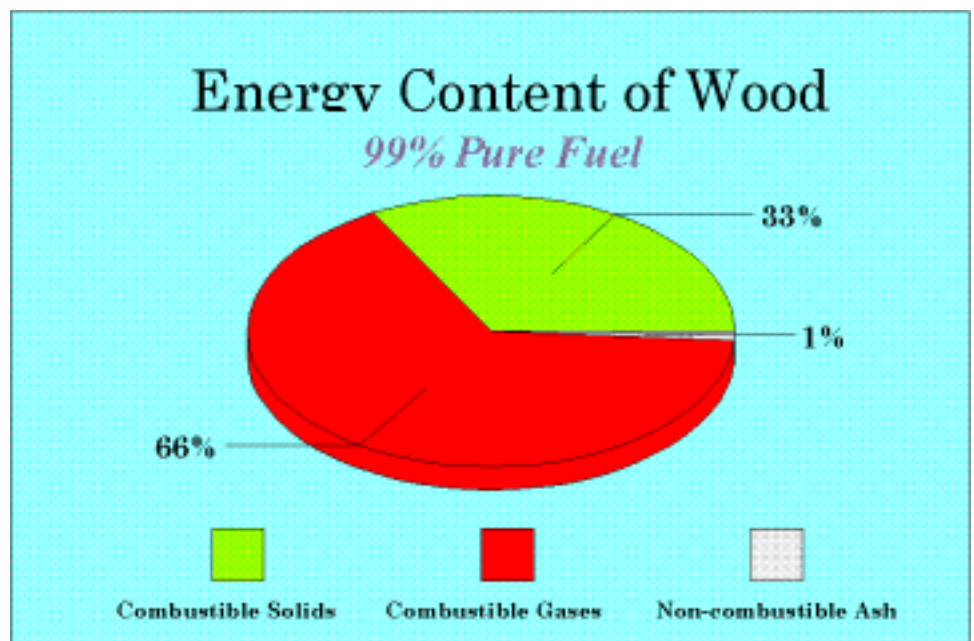
As a result of the field testing done on masonry heaters, the E.P.A. have included them in a follow-up report on wood stove emissions. The B.A.C.M. document (**Best Available Control Measures**) includes masonry heaters as acceptable due to their exceptional clean burning technology. This document is for various levels of government to reference when they are implementing state and local air quality regulations. (File #EPA-450/2-92-002 "Technical Information Document for Residential Wood Combustion, Best Available Control Measures", September 1992, by the U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711)

Wood - A Clean, Renewable Fuel

Wood, if properly burned, is a very "clean" fuel, comprised of 99% combustible solids and gases. The other 1% is non-combustible ash, which can be recycled into the garden. In addition, efficient wood-burning does not add to global warming or acid rain, since burning releases about the same amount of carbon monoxide, carbon dioxide and methane as the natural decomposition of wood on the forest floor.

Although wood is one of few truly "renewable" fuels, it is vastly under utilized in North America.

Many countries encourage wood use for home heating and have comprehensive forest management plans which take into account the value of wood as a heating fuel. It is comparatively inexpensive to grow, manage, harvest and handle.



Properly managed, an industry surrounding wood use as a house heating fuel would create thousands of local jobs, reduce our dependence on other fuels, and be beneficial to our planet.

What Price Do We Pay for Convenience?

Non-renewable fossil fuels, although convenient for consumers, are generally difficult and expensive to obtain and environmentally harmful to produce, transport and use.

Society is becoming increasingly concerned with the negative environmental impact of fossil fuel usage around the world. The damage by oil spills worldwide will have lasting serious effects on the oceans and sea life. Natural gas pipelines have been pushed through sensitive arctic tundra, disrupting wildlife and exposing these areas to a potential disaster. The extensive damage to the ozone layer, global warming, and acid rain are all legacies of our insatiable appetite for more energy to operate our machines and warm our homes.

Convenience and this same craving for energy has allowed electrical production to flourish, again with some negative ecological impact. High-power lines are suspected of causing illnesses, dams divert water from fish spawning grounds and nuclear plants are labeled environmental "time bombs".

Energy Probe, an environmental "think tank" in Toronto, concludes that the electricity to operate a single domestic hot-water tank in Ontario creates 200,000 lethal doses of plutonium annually. Sixty percent of Ontario's electricity is nuclear. (Ref. *Masonry Heater News*, Vol. 5, #2)

In Sweden, 50% of the homes are heated electrically, and half of this energy is provided by nuclear power plants. Recent strong environmental concerns have brought pressure to bear on the Swedish government to close all 12 nuclear plants by the year 2010. It is believed that this reduction in electrical energy can only be offset by alternate energy sources such as solar and wood.

Although expedient, heating our homes with gas, oil or nuclear fueled electricity may be environmentally questionable. And it may be unnecessary, with alternatives such as solar heating and masonry heating now available. We must ask ourselves what environmental price our children will pay for the convenience we demand today.

Health, Comfort & Quality of Life

"Finnish fireplaces produce gentle, long term radiant heat that directly affects the indoor environment in a profound way." (Ref. Albert Barden &

Heikki Hyytiainen, Finnish Fireplaces - Heart of the Home)

Homes heated with a radiant masonry heater are relatively quiet and have a cozy warmth which you may only notice when you step outside. Because the air is not being directly heated by the fireplace, as it is in a forced air system, it is cooler and seems fresher, a welcome change to allergy sufferers.

By contrast, metal stoves and forced-air furnaces tend to "fry" the dust in household air, due to their higher surface and burner temperatures, causing an unpleasant smell and dry air. European authorities are now studying the adverse biological effects of "fried" household dust.

"It should also be noted that the whole concept of airtight house construction and its accompanying problems of indoor pollution is healthily challenged by masonry wood heating. With masonry heaters we are not trying to heat the room air by forced convection from some remote, dusty, central heating system. We are instead heating solid materials and people by direct radiation. Such a system creates warm, solid surfaces and fresh, clean air." (Ref. Albert Barden & Heikki Hyytiainen, Finnish Fireplaces - Heart of the Home)

Since a masonry heater does not superheat the air, currents and drafts caused by the hot air/cool air cycle are

reduced, and with them, the "indoor weather". In addition, there is no powerful fan pushing the air around, contributing to this moving air and "wind-chill".

Another subtle benefit of this type of heating is the stimulating effect of slight variations in heating from room to room. (*Slight* is the important word - large differences in heating from room to room are a little too stimulating for most people.)

"The user of a fireplace comes to understand that fire, like the sun, is a life-sustaining and renewing force, that the real purpose of a fireplace is to renew the energy of those who gather around it." (Ref. Albert Barden & Heikki Hyytiäinen, Finnish Fireplaces - Heart of the Home)

A little known wood-heating phenomenon concerns the balance of positive and negative ions in a room and how it affects our bodies.

Ions are naturally occurring charged particles in the air, and are usually not a concern unless the natural

balance is upset. A room with insufficient negative ions can cause adverse biological effects on its occupants such as sleepiness, headaches and lethargy.

Metal stoves give off positive ions to a room, which upsets this proper balance. Masonry stoves, because of their large radiating surfaces and low external temperatures, do not cause this problem.

Safety

There is no safer wood-burning heater than a properly constructed masonry stove. It is only fired for a few hours a day while you can watch it, and never at night when you sleep.

After the fire is out, there is no part of the heater's exterior that is unsafe to touch, with surface temperatures in the 155 to 175 degree F. (68 to 79 deg. C) range. In fact, it is quite safe and comfortable to sit with your back to the masonry facade to soak up warmth. Many old European stoves had a sleeping platform built onto the top of the heater and some people

today incorporate a heated sitting nook or bench into their designs.

Chimney fires are a major concern in North America, causing house fires which result in needless deaths and destroyed homes.

Chimney fires are a serious problem with metal stoves and wood furnaces, due to typically low operating temperatures and resulting low combustion efficiency. This allows unburned gases to form tars and compounds in the smoke, which then condense in the chimney system, forming creosote, the fuel for a chimney fire.

This problem is virtually eliminated with a masonry stove, mainly due to the heat storage ability inherent in their designs. The masonry mass and large heat storage allows them to be operated *comfortably* at high temperatures, which creates consistently high combustion efficiency. These two features, which are unique to masonry stoves, ensure that all combustible gases are burned in the heater, producing heat, not creosote.