

Wood

The Pellet Fuels Institute has made a mission of informing consumers of the convenience and practicality of using wood pellet fuel, and now that over 600,000 homeowners have learned the efficiency and practicality of using pellet stoves, it now turns its attention to the millions of large-scale commercial applications for which pellet fuel is suited. Such systems have already been working efficiently and effectively for twenty years.

Whether you are a school administrator, business owner, factory manager or energy consultant, you have a unique opportunity to free yourself from the price fluctuations of oil and gas and embrace a convenient, environmentally sound and forward-thinking way to heat.

Pellet fuel can change the way we do business forever.



Pellet Burner

Boiler Auger

Boiler Controls

Three-Ton Pellet Hopper

PELLETS IN ACTION

THEATER

The 600 seat Elma Theater in Elma, Washington opened in November of 1928, and has had a proud history of showcasing regional performers ever since. After many years of heating the theater with oil, a unique, pellet-based system was recently installed that has cut costs dramatically. Rather than a single large burner, the facility uses several smaller burners, and even a single pellet stove in the lobby.

MANUFACTURING FACILITY

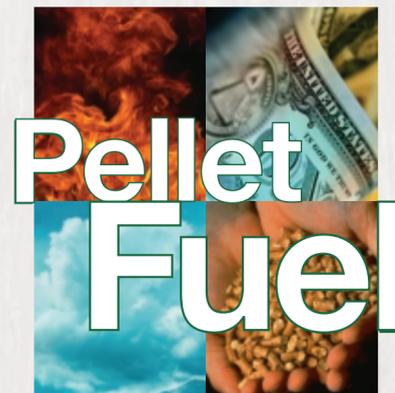
A pellet fuel manufacturing facility not only recently opened a new operation in Claremont, NH in 2002, but installed a state of the art pellet heating system on site. This small business (10 employees) will enjoy the reliability, efficiency and cost-effectiveness for many years to come.

PRISON

The Washington State Penitentiary at Walla Walla, the largest prison in the state, has used pellets as their primary heat source since Dec, 2000. Currently, they burn an average of 40 tons of pellets a day (13,000 tons a year), and has seen a reduction in fuel expenses of 30% since switching from natural gas.

HYDROPONIC FARM

This Hydroponic tomato farm in Sutton, Quebec has burned pellets as its primary heat source since 2000. The system was installed with the assistance of a government renewable energy initiative, and is so efficient that even the excess CO₂, needed by all growing plants, is channelled from the burner back into the greenhouse to help nourish the tomatoes!



Pellet Fuels Institute

1601 North Kent Street, Suite 1001
Arlington, VA 22209
Phone: 703.522.6778, Fax: 703.522.0548
E-mail: pfimail@pelletheat.org

www.pelletheat.org

THE WIDER WORLD OF PELLET FUEL

Pellet Fuel

THE WIDER WORLD OF PELLET FUEL

Already an accepted and efficient method of home heating, wood pellets are poised to take on commercial applications with unparalleled economy, versatility and practicality.

What if

there was a fuel capable of heating millions of homes, businesses and schools in the United States, Canada and elsewhere?

What if that fuel was already here in North America... not half a world away?

What if it was renewable, economical and sustainable and what if we had the know-how to make it work?



What if it burned as cleanly as any of the fossil fuels?

What if the use of this fuel was as much a boon to regional economies as it was to the environment?

How much would you be willing to pay for this amazing fuel?

Well, what if we told you that you wouldn't have to pay more for it than you would for oil, coal, propane or natural gas?

This miracle fuel is wood pellets.



With proper forest and agricultural management, wood pellet supply is limitless and self-generating



WHAT IS BIOMASS FUEL?

Cordwood, wood pellets, wood chips, waste paper, along with a dozen other agricultural byproducts capable of being burned for heat, are all examples of biomass fuel. The most compelling principle of biomass is that it is renewable. Given proper forest and agricultural management, biomass is limitless, and has historically proven to be price stable in the bargain. The environmental miracle of the fuel is that it essentially turns waste products into energy, and is in ample supply precisely in the areas hardest to reach with oil and gas.

Sustainable Forest Initiatives, wood manufacturing byproducts and other forms of forest management provide pellet fuel manufacturers with low cost materials by retrieving biomass materials from these programs. The majority of North America's forest is second-growth, and requires periodic treatment in order to address forest health and fire mitigation. A tremendous amount of unusable material remains on the forest floor after such treatment; material rejected by high-end wood product manufacturers but a perfect resource for commercial pellet manufacturers. In many areas of the Midwest, the Forest Service will provide this waste material at little or no cost beyond the expense of hauling it away.

And the reusable material possibilities are limitless. Currently, U.S. companies dispose of millions of tons of wooden pallets every year, a resource perfect for commercial pellet manufacture. Biomass such as cornstalks, straw, wastepaper, even animal waste...biomass in general converted to pellets can save billions of tons from filling landfills and put them to work.

THE BENEFITS OF PELLET FUEL

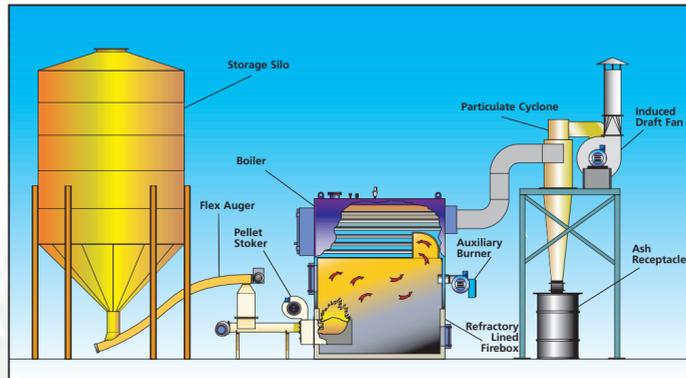
Wood pellet manufacturers take ground wood, waste wood, paper, bark and other combustibles and turn them into bullet-sized pellets that are uniform in size, shape, moisture, density and energy content. Why not simply burn cordwood or raw wood chips? First, the moisture content of pellets is substantially lower (4% to 8% water, compared to 20% to 60% for cordwood or chips), increasing burn efficiency. Less moisture means more fuel can be transported in a given truck space, and more energy can be stored at your site. Second, the density of pellet fuel is substantially higher than cordwood (40 lbs. per cubic foot vs. 23 lbs. for cordwood). Third, pellets are more easily and predictably handled in a large-scale application than raw wood. Their uniform shape and size allows for a smaller and simpler conveying system that reduces costs. This high density and uniform shape can be stored in standard silos, transported in rail cars and delivered in truck containers. Of course, in transport as well as end use, pellets pose none of the risk of explosion that raw wood does.

Low emissions are the clincher for pellets, as their remarkable consistency and burn efficiency produces a fraction of the particulate emissions of raw wood. Pellet burners feature the lowest particulate matter emissions of all solid fuels burners.

Arsenic, carbon monoxide, sulphur and the greenhouse gas carbon dioxide are just a few of the air and water pollutants resulting from the use of oil as a heat and energy source. Our dependence upon such fossil fuels has turned cities such as Denver, Los Angeles and even Aspen into air danger zones. Even if the supply of oil was unlimited, the environmental costs of transporting and burning ever-increasing amounts are

COMMERCIAL PELLETS AND FOREST HEALTH

Commercial pellets use a higher percentage of agricultural and forest byproducts than those made for home use, encouraging efficient forest use, increasing ease of manufacture and reducing costs.



SYSTEM COMPONENTS

The components of a commercial pellet fuel system mirror their fossil fuel counterparts, and in most cases retrofitting will require little change to either the boiler or heat delivery system. In many cases, even existing oil or coal burners won't require replacement, but simple modifications to burn pellets.



Pellet burners are so efficient that their emissions meet even the most stringent EPA standards

simply unsustainable. In fact, since pellets burn so efficiently (system efficiency averages at 80 percent!), emissions from pellet burners meet even the most stringent EPA requirements.

So what comes out of the pellet vent? Basically, what emerges is the same as what escapes from your home fireplace, with substantially reduced particulate emissions.

When you heat with wood, carbon dioxide is released into the atmosphere. Trees absorb this carbon dioxide in equal amounts as they grow, so burning pellets does not increase the amount of this greenhouse gas in the atmosphere.

Any remaining ash in the burn chamber, when removed, is hardly a problem either. Ash is basically a mineral, composed of silica (sand), manganese, iron, alumina and other minerals. Once the ash is emptied periodically, it can actually double as a fertilizer. Try that with used heating oil! Finally, pellet storage poses no soil or water contamination risks. A spill can be cleaned with a shovel...not a hazardous waste crew.

PRICE COMPARISON	
FUEL	AVERAGE COST per MMBtu
Heating Oil	\$5.50 – 7.50
Electricity	\$25.00
LP Gas	\$9.00 – 20.00
Natural Gas	\$7.00 – 9.00
Coal	\$6.75
Pellets	\$9.00

COMBUSTION SYSTEMS & CHANGEOVER

Though pellet fuel installations have a reputation in some circles as "alternative" choices, their functional components are virtually identical to those of the more conventional oil, coal or gas systems. They include a sizeable storage container, a burner, an automated feeder to supply that burner, a boiler, exhaust system and chimney. Those watching a new pellet-fueled business will notice virtually no changes to the exterior. There is no need to bury the storage tanks, because there is no volatile oil or gas to deal with. Any storage can take place above ground, making maintenance and filling easier and further reducing costs of installation and upkeep.

A heating system producing approximately 500,000 Btu/hr (the size of a small school's system, for instance) currently burning oil, coal, or natural gas, in many instances can be changed to burn pellets with retrofits made only to the burner, plus the addition of a combustion conveying system and a storage container. In such a system, the existing boiler and heat delivery structures remain unchanged. Solid fuel systems such as those burning coal or wood chips can actually be even more easily retrofitted to burn pellets through simple feeder and air supply adjustments.

Once the heat requirements of a new system approach the 3,00,000 Btu/hr mark,



The low moisture content of pellets means increased burn efficiency, efficient transport and reduced costs



GETTING OFF THE FOSSIL FUEL ROLLER COASTER

It didn't feel like an energy crisis, exactly. There were no crazed motorists waiting all day to buy gas...no "end of the world" street corner admonishments. It was just that the prices of oil, natural gas and propane continued to rise steadily in the winter of 2001; from 90¢ a gallon for heating oil in 2000 to \$1.20 in January to \$1.50 and more in March. Natural gas prices (measured in dollars per thousand cubic feet) increased from an average of \$7 to a high of \$10 in the same period of time, and heating oil experienced a similar spike. This grinding fuel inflation hit the economy in its most vulnerable sector, and the working poor and off-grid country business owners in the wallet.

Though the Department of Energy's fuel price forecasts for the next several years show a stable marketplace, anyone who navigated through the price spikes of winter, 2001 will attest to the danger of counting on market guesses.

It is reasonable to extrapolate that fossil fuels will experience price fluctuations of 30 to 40 percent over the next ten years (adjusted for inflation) since that has been the trend for the last half-century. Throw in a crisis or an international event that chokes supply and there is no telling what periodic spikes there will be in the interim. In that same period of time we are expected to increase our importation of foreign oil from the 55 percent share of total oil consumption today to over 60 percent. Considering the human and economic impact of September, 2001, that statistic looms large for anyone contemplating running a business on oil or natural gas.

Pellet fuel is expected to experience a hike of ten percent during that same ten

PELLETS ON THE RAIL AND ROAD

Pellets can be stored in standard silos, hauled in standard rail cars, and quickly delivered in truck containers. They are made to be safe, reliable and highly transportable.

years, and since forecasters rely on regional manufacturers for their production estimates, that guess is likely to be far more accurate than oil estimates from OPEC. Given that hundreds of businesses were forced to shut their doors due to the dizzying spike in fuel costs in 2001, doesn't it simply make better sense to rely on local resources for your warmth?

THE BOTTOM LINE

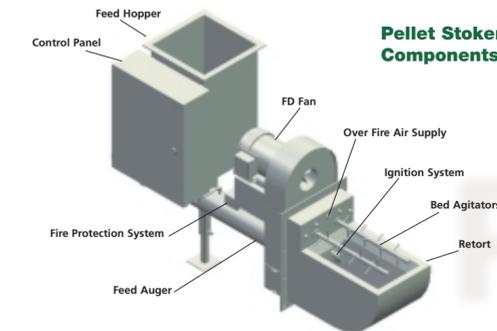
Whether the intention is to purchase an entirely new system for new building construction or to modify an existing system, pellet heat can provide a cost-efficiency that can rival oil, natural gas and propane, with benefits to both the local economy and global environment.

Cheap to Buy: While it is impossible to generalize about costs of manufacture or delivery given the variances in any local economy, as long as a consistent and predictable source of biomass fuel is available, pellet systems are poised to compete with oil, coal and gas at the cost game. Installation expenses combined with the resulting first year costs are, of course, going to exceed the cost of continuing with an existing fossil fuel system, but lower fuel costs over time will quickly pay back those expenses, in many instances in as little as five years or less. After that period your savings will simply mount...year after year.

Moreover, pellet fuel has not ridden the wave of market fluctuation the way oil and natural gas have. In 1990, a ton of pellets cost about \$80, and has changed little since. Typically, pellet costs have not even kept pace with inflation rates, which means that your same \$80 ton is actually a much better buy now than it was ten years ago!

Ready Technology: Pellet fuel has been utilized in Northern Europe for years in commercial heating systems...even for fueling large electrical generators.

There are several manufacturers of solid fuel boilers and burners, and all can be installed to burn pellets quite easily. Costs of systems vary with size and individual modifications, but a 1,000,000 Btu system can be installed for roughly \$40,000, and though more expensive than buying a typical gas



Pellet Stoker Components

burner, for instance, fuel savings will absorb those costs quickly.

Available Supply: The fuel is cheap and the burners are waiting, but the most important factor in contemplating a changeover from fossil fuel to pellets is knowing that there will be ample supply of fuel when and where you need it. Again, commercial applications have the upper hand over home pellet burners in this regard. Virtually all areas of the country have fuel manufacturers to choose from. The over 600,000 residential pellet stove users and the increasing use of larger home boilers and furnaces has slowly created a market that scores of manufacturers are keen to supply, and the ease of pellet storage and transport has made it much easier for residential pellet fuel manufacturers to go commercial. There is no way of knowing how effectively you are supplied locally without checking first, but from Maine to Manitoba, you are likely to find a supplier poised to fill your order.

Running a business means making tough decisions, weighing costs and benefits and even judging the next turn in the financial road. Pellet fuel will put your business ahead in all those areas. It will encourage the economic and energy independence of your community, reduce your costs and clean the air in the bargain. If only every decision were this easy!

- Good Business
- Cleaner Environment
- Stronger Community

Pellet Fuel Will Make it Happen



Pellet burners feature the lowest particulate matter emissions of all solid fuels burners