ENERGY ALTERNATIVES: COAL

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Coal is solar energy that has been stored for 100 to 300 million years. Total identified reserves in the United States amount to 1600 billion tons, of which 434 billion tons are considered economic to mine at today's prices and with present technology. With annual consumption averaging 0.6 billion tons, the reserves should last several hundred years.

Most of the coal used in the northeast is anthracite (hard) coal. This is mined in eastern Pennsylvania and shipped by truck or rail. Bituminous (soft) coal is available but used only in heating plants with pollution control equipment that limit sulfur emissions to less than 0.5%.

The price of coal in Connecticut varies from $100 to $130 per ton in one to three ton quantities and $75 to $90 per ton in truck loads. Coal takes about one-third the space of wood. Although it does not abosrb moisture, a covered bin area convenient to truck access and the heating plant should be used.

One ton of coal has the equivalent heat value of 150 to 180 gallons of fuel oil. Although the potential savings from converting to coal seem significant, other factors should be considered.

More labor is required to burn coal than oil or gas even if an automatic stoker is used. Most larger systems employ night men to oversee the heating plant. Ash removal and boiler cleaning are also necessary in this operation.

Although some of the older boilers that once used coal can be reconverted, it is often best to install one of the modern efficient heating units. These cost in the range of $1000-$2000 per 100,000 BTU per hour output. During the past few years, several new manufacturers have started marketing coal units, both furnaces and boilers. A list of some of these is available from the author.

In Connecticut the Department of Environmental Protection regulations require that a permit be obtained for all solid fuel burning equipment with a heat input of 250,000 BTU per hour or more. Applications are available from the DEP, State Office Building, Hartford, CT 06115.

Emission of visible pollutants is limited by these regulations as is the release into the air of particulate matter, namely fly ash. Copies of the regulations are also available from the above address.

As many older growers will tell you, operating a coal fired unit is much more difficult than turning the thermostat on an oil furnace or boiler Coal having an ignition temperature of 800-900°F is more difficult to start and to keep going than wood.

A heating unit designed for coal is different than one for wood. The firebox is usually taller than it is long to get the deep bed of coal with its several layers and higher fire temperature. The grate used to support the fire (and supply the draft air evenly) must be sized for the type of coal used.

More draft is needed when burning coal to draw the air through the tightly packed ash layer and bed. A larger or taller chimney may be needed or, as in the case of high output units, a forced draft can be used. The draft control system on the heating unit should be designed to supply most of the air as primary air below the grate. This is just the opposite of a wood unit.

One advantage to hard coal when compared to wood is that no creosote is formed. This eliminates the potential for chimney fires.

Solid fuel units burn constantly and not intermittantly as with oil or gas units. For this reason particular attention should be paid to the safety control features of the unit. On hot water boilers this may consist of pressure, temperature relief valves, draft control when water jacket temperature exceeds a set limit and circulating pump control which allows the water to circulate through the radiators when the boiler overheats. On furnaces, besides the damper control, the blower is wired to operate continuously when the duct temperature exceeds 250°F.

The installation of a furnace or boiler is not a job for an amateur. It should be installed by a qualified installer in accordance with National Fire Protection Association standards, state codes and the manufacturer's recommendations. In Connecticut the installation requirements are specified by the state building code and a permit is needed in addition to the DEP permit.