

The Case for Pellets



Wood Chip Systems

Whole Tree Chips

- cut locally (within 50 miles ideally)

- delivered using self unloading trailers

Processed White Wood

- cut regionally

- processed to reduce twigs, branches, frozen clumps

- delivered using self unloading trailers

Wood Pellet Systems

Pellets are produced using waste wood or trees cut for this purpose-renewable and local

Pellets are dry, uniform in size, flow easily and are uniform in heating value and ash content

Fuel

Chips

\$35 to \$65/ton

@45% M.C.

9.3 mm BTU/ton

\$3.76 to \$6.90

/mm BTU

Pellets

Fuel

Chips

\$35 to \$65/ton

@45% M.C.

9.3 mm BTU/ton

\$3.76 to \$6.90

/mm BTU

Pellets

\$195 to \$240/ton

@5% M.C.

17 mm BTU/ton

\$11.50 to \$14.11

/mm BTU

Combustion Efficiency

Chips

Pellets

75 % to 85%

Varies based on M.C.,
wood species, time of
year, level of routine
maintenance

Combustion Efficiency

Chips

75 % to 85%

Varies based on M.C.,
wood species, time of
year, level of routine
maintenance

Pellets

85% +

Varies based on power
called for by the
system

Stack Emissions

Chips

Pellets

Can meet standards
with proper air
control, fuel feed and
stack cleaning
equipment such as
multi-clones,
baghouse, ESP

<.03 lb/mmBTU

Stack Emissions

Chips

Can meet standards with proper air control, fuel feed and equipment such as multi-clones, baghouse, ESP

<.03 lb/mmBTU

CO < 100 PPM@7% O₂

Pellets

Guaranteed to meet new EPA standards

<.03 lb/mmBTU

CO < 100 PPM@7% O₂

Fuel Delivery

Chips

Pellets

Delivery using truck
trailers with self
unloading feature-25
tons per load = 85.75
mm BTU/load

Fuel Delivery

Chips

Delivery using truck trailers with self unloading feature - 25 tons per load = 85.75 mm BTU/load

Pellets

Delivery using small delivery trucks with 4" nozzle delivery hose-10 tons per load = 170 mm BTU/load

Support Costs-Electricity

Chips

Pellets

Bunker, conveyors, fans,
compressed air or
hydraulics

Load = 41 KW

Assume 800,000 BTU/hr

System

Support Costs-Electricity

Chips

Bunker floor, conveyors,
fans, compressed air or
hydraulics

Load = 41 KW

Assume 800,000 BTU/hr
System

Pellets

Bin feed screw, fans, ash
chamber and tube
cleaning systems

Load = 4 KW

Assume 800,000 BTU/hr
System

Turndown

Chips

Pellets

Typically, turndown will be 4 or 5 to one-
accomplished with
fuel feed rate and
combustion air
changes

Turndown

Chips

Typically, turndown will be 4 or 5 to one with single boiler-
accomplished with fuel feed rate and combustion air changes

Pellets

Cascade system using four boilers allows for a 15 to one turndown by varying output on one boiler or four boilers-run longer in swing seasons and for DHW

Operational Costs-Labor

Chips

Pellets

Ash cleaning

Tube cleaning

Preventive maintenance

General maintenance

3 hours/week

\$90/wk

Operational Costs-Labor

Chips

Ash cleaning

Tube cleaning

Preventive maintenance

General maintenance

3 hours/week

\$90/wk

Pellets

Empty ash container

¼ hour/week

\$7.5/wk

Capital Costs

Chips

Pellets

Site, buildings, controls,
electrical, plumbing,
boiler, fuel system,
stack and cleaning
equipment

800,000 BTU/hr system
Cost = \$1,200,000

Capital Costs

Chips

Site work, buildings, controls, electrical service, plumbing, boiler, fuel system, stack and cleaning equipment

800,000 BTU/hr system

Cost = \$1,200,000

Pellets

Pad, piping, electrical, energy box fitted with storage for pellets, internal plumbing, internal electrical, four boilers, controls

800,000 BTU/hr system

Cost = \$200,000

Construction

Use of the energy box with multiple boilers

- eliminates the need for building construction and associated permits
- allows the oil boilers to remain as backup
- no three phase power required
- energy box is preassembled, wired with controls and with plumbing
- self contained stacks

Final Thoughts

Wood chips are less costly than pellets, but the cost of the systems for use of chips is high

Most pellet systems are able to be installed and paid for using only the cash flow based on fuel savings

Pellets should be considered and compared for simple operation, cost and low impact on the school campus