Heat for the Kilns: Making Energy Decisions at the Mill

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Ward Lumber Co.

- 10 MMBF / year pine sawmill,
- boiler & kilns,
- planer mill, and
- retail yards.

- Focus here will be considerations in burning wood waste.
- We’ve been burning pine waste since 1988.

As a cost example:

- In 1998 we built a building, and
- bought, installed, piped and wired
- a 160-hp rated wood-burning steam boiler,
- for $428,000 ,
- including sawdust bin and bin unloader.

Decision to burn wood waste was based on:

- beliefs and emotion,
- as much as
- wood vs. oil vs. gas boiler abilities.

I hated the thought of burning oil, while we literally piled up dry hogged planer end trims that farmers didn’t want to buy!

- I can not compare costs of burning oil vs. wood vs. natural gas,
- but I can tell you that if you have mill wood residue you control your cost of fuel, not OPEC!

Advantages of burning wood vs oil or gas:

- Lower cost of fuel (wood waste residue) - this is a huge factor.
- Non environmentally hazardous transport, storage, piping, leaks.
- No sulfur emissions (pollution) when burning wood.

Advantages …..

- Can perform electrical co-generation and use “waste steam” to heat kilns, buildings.
- Ash is not environmentally hazardous.

Disadvantages of burning wood:

- Blowing, conveying or bucket loading fuel in hopper.
- Requires a larger furnace than oil or gas (higher initial cost ?).
- Requires lots of airflow (fan HP) to burn wood vs. oil & gas (ours = 40 hp).

Disadvantages ……

- Oversize wood chunks can clog feed system.
- Frozen winter wood is less efficient fuel when you have greatest need for heat.
- Ash settles in firetubes, requiring cleaning or costly air agitation systems.

Wood vs. Oil
Cost / Value Comparison:

- A ton of green softwood is equivalent to 40-45 gallons of fuel oil, hardwood about 50 gallons.
- If a ton of pine chips is worth $12/ton at our mill, equal to about $70-78 worth of fuel oil at $1.75/gallon.

Wood vs. Oil Cost ….

- Or…. $12 divided by 40 gallons =
  –30c per gallon oil cost.
- Unfortunately, we are burning some sawdust worth $25/ton.
- So, our cost would be equivalent to about 55-60c/gallon.
- Still cheap!

Sizing your wood boiler: I'm not an expert, but…….

- Kilns drying white pine can require up to 80 btu/mbf for proper heating and extensive venting needs.
- Obviously, kilns drying oak require a fraction of that.

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- Wood boilers aren't often supplied the 35% mc fuel specification that our boiler's HP rating was based.
- So, you may want to "oversize" a new boiler based on an average of frozen winter fuel and drier summer sawdust.

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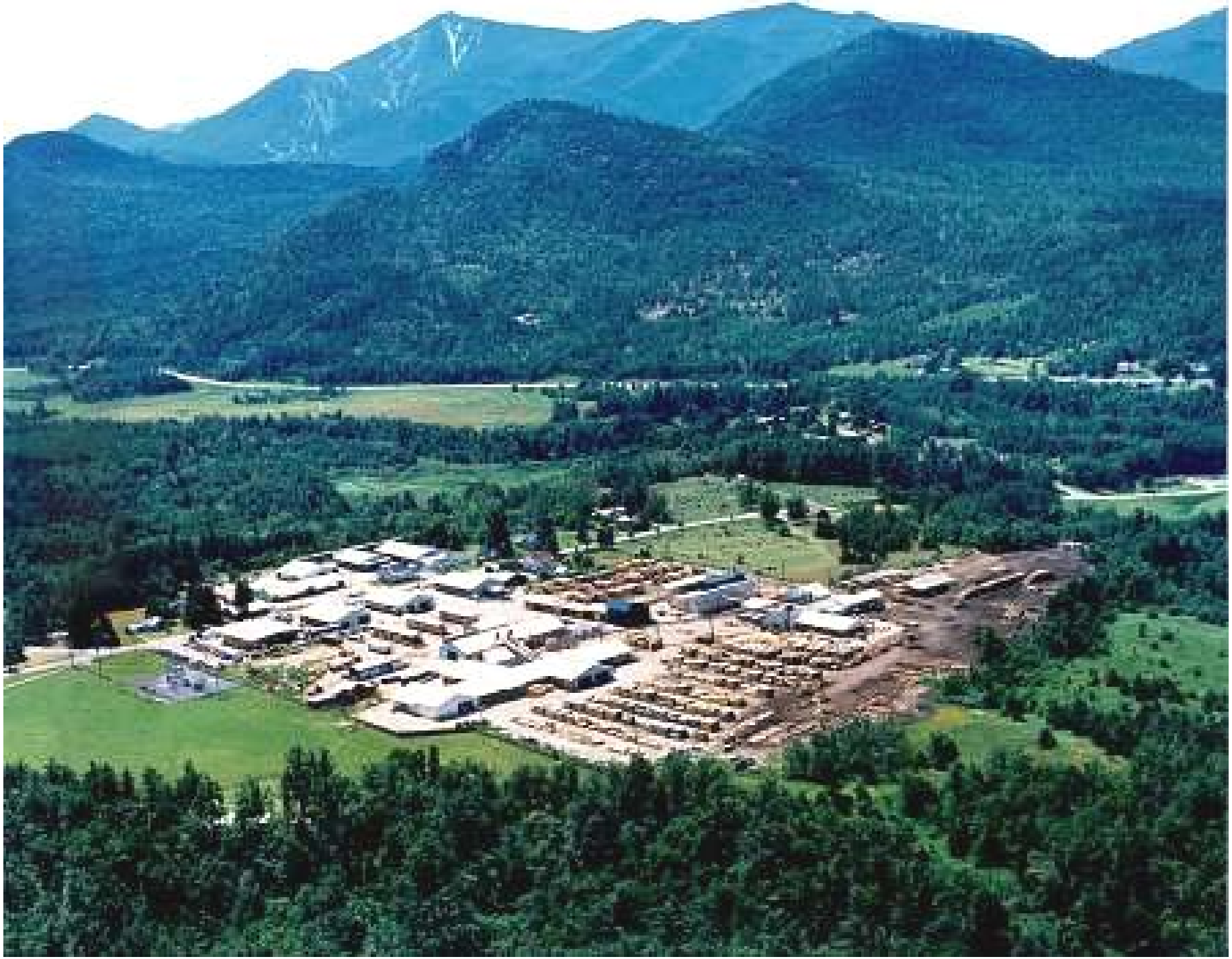
- Our boiler was rated at 160 hp, but we have only realized 111 hp with higher moisture fuel and no auto air dampers tied to combustion sensors.
- Take it from me, size it big enough the first time for future kiln needs.

Summary:

- Overall, I am very pleased that we are burning wood, especially with oil hitting record high prices almost weekly.
- I would recommend a boiler system sophisticated enough to automatically adjust its combustion efficiency.

- I would recommend Co-Gen to someone considering a new installation.
- Co-Generation is not a slam dunk, but many states are pushing for more renewable energy, and therefore have grants available to assist in feasibility research, planning and even capital costs.



Thank you!

Questions,

Comments?