



Wood Chip Drying and Costs

Energy required to dry wood:

- 1,500 - 1,600 btu's to remove 1 lb of water from wood chips
- Drying 1 ton of green pulpwood at 50% moisture content to 20% moisture content yields:
 - 1,760 lbs green wood + 240 lbs green bark
 - 1,100 lbs of wood at 20% moisture content after drying with 1,056,000 btu's of energy
- If using all natural gas (\$10/MCF), then cost of fuel to dry 1 green ton = \$10.56
- Utilizing bark to dry wood:
 - The bark could be used in a biomass burner to dry the wood
 - Assuming a 60% efficiency in bark combustion system, 240 lbs of bark/ton x 4,300 btu's/lb x 60% = 620,000 btu's available to dry wood.
 - This will only supply 59% of the needed energy to dry one ton of green wood to 20% moisture content.
 - Natural gas could be used to supplement the additional requirement.
- Approximate Costs:
 - \$25/ton purchase cost of wood and bark
 - 240 lbs bark = 12% of ton
 - $\$25 \times 12\% = \3 = cost of 620,000 btu's from 240 lbs bark
 - 436,000 btu's from natural gas = $.436 \times 1 \text{ million btu's/MCF} \times \$10/\text{MCF} = \$4.36$ cost of natural gas
 - Total fuel cost = \$7.36 (to dry 1 US ton green wood to yield 1100 lbs wood at 20% mc)
 - \$13.40 to dry green wood to yield 1 US ton wood at 20% mc
 - \$15.20 to dry green wood to yield 1 metric tonne wood at 20% mc
- System cost of a 10 ton/hour drier + biomass burner + emission equipment + fuel handling is estimated to be approximately \$5 million installed. This does not include chippers, grinders, truck dumps, scales and other chip conveying not associated with the drier or burner.
- Approximate operation and maintenance cost of the system is \$1 million per year. This does not include fuel costs listed above.

Sources

Nathan McClure, Georgia Forestry Commission

Gary Elliott, International Applied Engineering, Inc.