

Combustion Analysis

	Before	After
O ₂ (%)	8.77	9.62
CO (ppm)	13,863	7
NOx (ppm)	26	89
CO ₂ (%)	5.73	6.34

From the combustion analysis, CO content is very high. After adjustments, CO at 7 ppm is very good. CO₂ went up meaning complete combustion occurred. NOx will naturally go up when complete combustion occurs due to higher heat. Overall the combustion analysis afterwards is very good.

Assumptions

Due to the nature of the study, there are many variables that can change hourly to daily. Therefore some common assumptions are made to start the study. Table 1 shows the assumptions.

Table 1. Assumptions given

Assumptions	xxxx' ID x xxxx' OL
Feed Temp - xxxxx °F	Prod Temp - xxxx °F
Inlet Gas Temp - xxxxx °F	Exhaust Temp - xxxx°F
Specific Heat - xxxxx Btu/lb°F	Radiation - xxxx%
Altitude - xxxx ft	Burner Efficiency - xxxxx%
Product Moisture – xxxxx%	Bulk Density – 100 lb/cu.ft

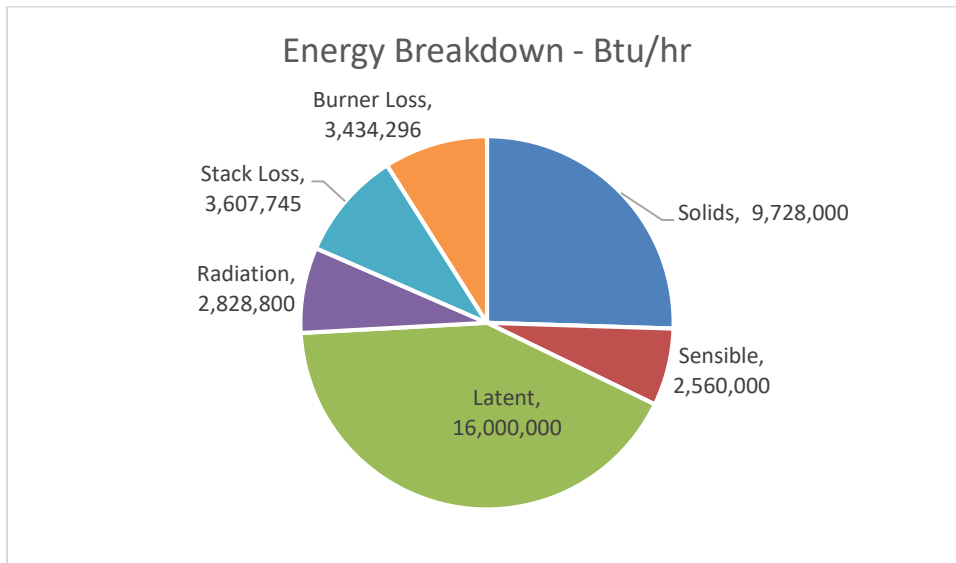
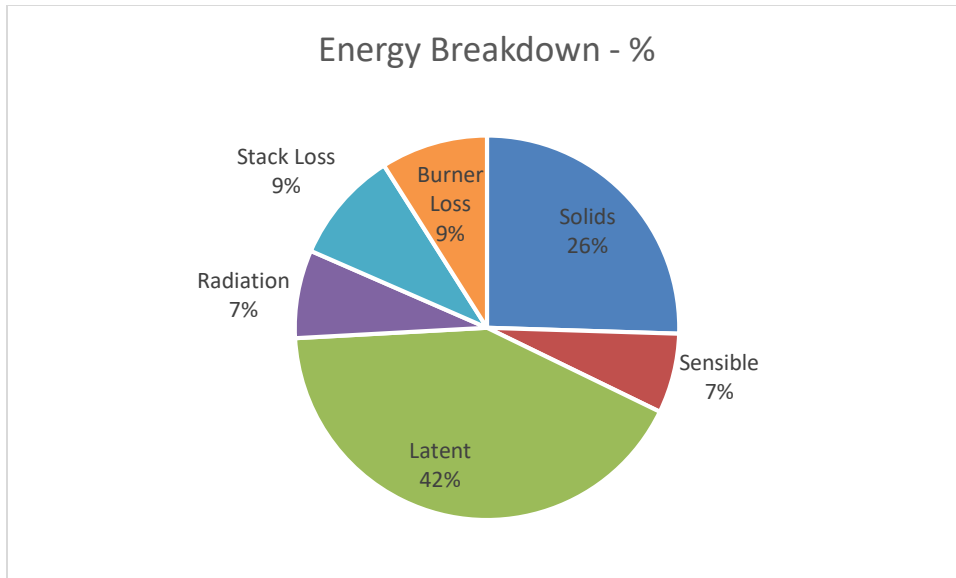
Mass and Energy Balance

Now that the assumptions are made, we can proceed with the heat and mass balance. This is ultimately an engineering thermal accounting of the amount of energy entering and exiting the system along with the masses entering and exiting the system as seen in Figure 1.



Figure 1. Basic diagram of material in and out

Results



Variable (Units)	Values
Evaporated Water (lbs/hr)	16,000
Process Energy (mmBtu/hr)	38.16
Water/Energy (lbs/mmBtu)	419.3