Revised Estimated Energy Savings For Ultra Low Flow Fume Hood

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Assume:
average hood flow rate: 1250 cfm
US hoods: 500,000
California hoods: 85,000
Maximum potential: 50%
air flow supply and exhaust system fan energy: 1 W/cfm (much higher at margin in retrofit)
chiller plant energy: 1 kW/ton
cooling peak delta T: 30 degrees F
average cooling delta T: 20% peak (6 degrees F)
cost per kWh: $.08
cost per kW: $120/year
Savings: 50% (75% for hood, but assumes minimum general lab exhaust overrides)

Cooling tons/hood: 3.44 (1250*1.1*30/12,000)
Cooling peak kW/hood: 3.44
air flow kW/hood: 1.25
Total peak kW/hood: 4.7
cooling kWh/hood: 6,027 (8760*3.44*.2)
air flow kWh/hood: 10,950 (8760*1.25)
total kWh/hood: 16,977
annual savings kW/hood: 2.3 ($276)
annual savings kWh/hood: 8,488 ($679)
total annual savings/hood: $955
California GW savings: .1
annual California GWh savings: 360
U.S GW savings: 1.1
annual U.S GWh savings: 2,100
Note: space heating was ignored and would add to savings

Reconciliation with 1996 LBNL report:

Our prior study assumed laboratories (not including cleanrooms) use 20 W/sq.ft. and 85 kWh/sq.ft./year and estimated that there were 45 million square feet of laboratories (not including cleanrooms). Combining the estimated square feet with the estimated number of fume hoods would yield an average of 530 sq.ft. of laboratory space for each fume hood. We feel this is reasonable considering the level of accuracy in both estimates. Actual savings will be higher in retrofit (significantly more savings with the supply air fan), and the number of new fume hoods in California is anticipated to continue strong growth. Each new hood will save 2.3 kW and 8.5 MWh/year.