

CHAPTER 6 Analysis of Cost Estimation

Table 6-14 Cost tabulation for selected utilities and labor

Utility	Cost
Electricity	0.045 \$/kWh ^a
Fuel	
Coal	0.35 \$/GJ ^b
Petroleum	1.30 \$/GJ ^b
Petroleum coke	0.17 \$/GJ ^b
Gas	1.26 \$/GJ ^b
Refrigeration, to temperature	
5°C	20.0 \$/GJ ^c
-20°C	32.0 \$/GJ ^c
-50°C	60.0 \$/GJ ^c
Steam, saturated	
10 ³ -10 ⁴ kPa (150-1500 psi)	4.40 \$/1000 kg ^{e,d}
Wastewater	
Disposal	0.53 \$/1000 kg ^e
Treatment	0.53 \$/1000 kg ^e
Waste	
Hazardous	145.00 \$/1000 kg ^c
Nonhazardous	36.00 \$/1000 kg ^c
Water	
Cooling	0.08 \$/1000 kg ^{e,f}
Process	0.53 \$/1000 kg ^e
Labor	
Skilled	33.67 \$/h ^g
Common	25.58 \$/h ^g

^aBased on U.S. Department of Energy, Energy Information Administration form EIA-861, 2001. U.S. average for year 2000.

^bBased on U.S. Department of Energy, Energy Information Administration form EIA-0348, 2001. U.S. average for year 2000.

^cR. Turton, R. C. Bailie, W. B. Whiting, and J. A. Shaeiwitz, *Analysis, Synthesis, and Design of Chemical Processes*, Prentice-Hall, Upper Saddle River, NJ, 1998.

^dU.S. Department of Energy, Office of Industrial Technologies, DOE/GO-102000-1115, December 2000.

^eU.S. Department of Energy, Office of Industrial Technologies, DOE/GO-10099-953, June 2001.

^fM. S. Peters and K. D. Timmerhaus, *Plant Design and Economics for Chemical Engineers*, 4th ed., McGraw-Hill, New York, 1991.

^g*Engineering News-Record* indexes, December 2001.

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