**UNDERSTANDING MEASURES OF ENERGY AND POWER**

DEFINITIONS, UNITS, AND EQUIVALENT MEASURES

Energy

Energy is a measure of work.

1 calorie = the amount of heat necessary to raise the temperature of 1 gram (1 cubic centimeter) of water by one degree Celsius

1 joule = 0.239 calorie = 2.778 x 10-7 kilowatt-hours

1 kilowatt-hour (kWh) = 3,413 Btus = 860,421 calories

1 Btu = 0.000293 kilowatt-hour = 252 calories = 1,055 joules

Power

Power is the rate at which energy is transferred, used, or transformed. Its measures are in terms of a measure of energy per unit of time.

1 watt = 1 joule/second = 14.34 calories/minute = 3.413 Btus/hour

1 kilowatt = 1000 watts

Energy Flux

Energy Flux is a measure of power per unit of area = energy/time/area

Emissions

Carbon dioxide emissions per kilowatt-hour are measured in pounds (lbs.)