

## Energy Measurements and Conversions

Deka = ten  
Hecto = hundred  
Kilo = thousand  
Mega = million  
Giga = billion  
Tera = trillion

1 metric ton = 2204.62 pounds  
1 metric ton = 1.1023 short tons  
1 kiloliter = 6.2898 barrels (petroleum)  
1 kiloliter = 1 cubic meter

### British thermal unit (Btu) measurements and conversions

Approximate definition: A British thermal unit is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

1 British thermal unit (Btu) = 252 International Table calories  
1 calorie = .00397 Btus  
1 Btu = .252 kilocalories (kcal)  
1 kilocalorie (kcal) = 3.968 British thermal units (Btu)  
1 Btu = 1,055 joules  
1 Btu = 1.055 kilojoules  
1 kilojoule = .947817 Btus  
1 therm = 100,000 Btus  
1 dekatherm = 10 therms  
1 dekatherm = 1,000,000 Btus  
1 kilowatt hour of electricity = 3,412 Btu  
1 horsepower = 2,545 Btu per hour

Convertit: <http://www.convertit.com/Go/ConvertIt/Measurement/Converter.ASP>  
Energy Information Administration: [http://www.eia.doe.gov/kids/energyfacts/science/energy\\_calculator.html](http://www.eia.doe.gov/kids/energyfacts/science/energy_calculator.html)  
Energy and Work Conversion – Unit Converter: [http://www.unitconversion.org/unit\\_converter/energy.html](http://www.unitconversion.org/unit_converter/energy.html)

BP Conversion Factors: <http://www.bp.com/conversionfactors.jsp>

### Joule measurements and conversions

Approximate Definition: the energy required to lift a small apple (102g) one meter against Earth's gravity (Wikipedia).

1 joule = .0009478 Btus  
1 Btu = 1,055.05585 joules  
1 kilojoule = 1,000 joules  
1 kilojoule = .947817 Btus  
1 Btu = 1.055 kilojoules  
1 kilojoule = .239 kilocalories  
1 kilocalorie (kcal) = 4.187 kilojoules (kJ)  
1 watt hour = 3,600 joules  
1 kilowatt hour = 3.6 megajoules  
1 megajoule = 1 million joules  
1 terajoule = 1 million megajoules

Online conversions: <http://www.onlineconversion.com/energy.htm>  
Convertit.com: <http://www.convertit.com/Go/ConvertIt/Measurement/Converter.ASP>  
Energy and Work Conversion – Unit Converter: [http://www.unitconversion.org/unit\\_converter/energy.html](http://www.unitconversion.org/unit_converter/energy.html)  
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### Electricity measurements and conversions Watt

Approximate definition: A human climbing a flight of stairs is doing work at the rate of about 200 watts (Wikipedia).

1 watt = 1 joule per second  
1 watt = 3.412 Btu per hour  
1 Btu per hour = .293 watts  
1 kilowatt (kW) = 1,000 watts  
1 kilowatt = 3,412 Btu per hour  
1 kilowatt = 1.341 horsepower

1 horsepower = .746 kilowatts  
 1 megawatt (MW) = 1 million watts  
 1 gigawatt (GW) = 1 billion watts  
 1 terawatt (TW) = 1 trillion watts  
 1 gigawatt = 1 million kilowatts

### Watt hours

Approximate definition: One watt-hour is the amount of (usually electrical) energy expended by a one-watt load (e.g., light bulb) drawing power for one hour (Wikipedia).

1 watt second = 1 joule  
 1 watt minute = 60 joules  
 1 watt hour (Wh) = 3,600 joules  
 1 watt hour = 3.6 kilojoules  
 1 kilowatt hour (kWh) = 3.6 megajoules  
 1 megajoule = .278 kilowatt hours  
 1 kilowatt hour = 3,412 Btus  
 1 kilowatt hour = 860 kilocalories  
 1 kilowatt hour = 3,600 kilojoules (kJ)  
 1 kilowatt hour = 1.34 horsepower hours  
 1 horsepower hour = .746 kilowatt hours  
 1 kilowatt hour = 1 thousand watt hours  
 1 megawatt hour (MWh) = 1 million watt hours  
 1 gigawatt hour (GWh) = 1 billion watt hours  
 1 terawatt hour (TWh) = 1 trillion watt hours  
 1 gigawatt hour = 1 million kilowatt hours  
 1 terawatt hour = 1 billion kilowatt hours  
 1 terawatt hour = 1 million megawatt hours

Online conversions: <http://www.onlineconversion.com/energy.htm>

Convertit.com: <http://www.convertit.com/Go/ConvertIt/Measurement/Converter.ASP>

Energy Information Administration: [http://www.eia.doe.gov/kids/energyfacts/science/energy\\_calculator.html](http://www.eia.doe.gov/kids/energyfacts/science/energy_calculator.html)

Energy and Work Conversion – Unit Converter: [http://www.unitconversion.org/unit\\_converter/energy.html](http://www.unitconversion.org/unit_converter/energy.html)

BP Conversion Factors: <http://www.bp.com/conversionfactors.jsp>

### Power measurements and conversions

1 Btu per second = 1.055 kilowatts  
 1 Btu per second = 1.415 horsepower  
 1 Btu per second = 1.434 metric horsepower  
 1 Btu per second = .252 kilocalories per second  
 1 kilowatt = .9478 Btu per second  
 1 kilowatt = 1.341 horsepower  
 1 kilowatt = 1.36 metric horsepower  
 1 kilowatt = .2388 kilocalories per second  
 1 horsepower = .7457 kilowatts  
 1 horsepower = 1.014 metric horsepower  
 1 horsepower = .1781 kilocalories per second  
 1 horsepower = .7068 Btu per second  
 1 metric horsepower = .9863 horsepower  
 1 metric horsepower = .7355 kilowatts  
 1 metric horsepower = .1757 kilocalories per second  
 1 metric horsepower = .6971 Btu per second

Biomass Energy Data Book, U.S. Department of Energy: [http://cta.ornl.gov/bedb/appendix\\_a.shtml](http://cta.ornl.gov/bedb/appendix_a.shtml)

Power Conversion – Unit Converter: [http://www.unitconversion.org/unit\\_converter/power.html](http://www.unitconversion.org/unit_converter/power.html)

Online Power Conversion: <http://www.convert-me.com/en/convert/power>

Energy and Work Conversion – Unit Converter: [http://www.unitconversion.org/unit\\_converter/energy.html](http://www.unitconversion.org/unit_converter/energy.html)

### References

Energy Kids Page, Energy Information Administration, ([http://www.eia.doe.gov/kids/energyfacts/science/energy\\_calculator.html](http://www.eia.doe.gov/kids/energyfacts/science/energy_calculator.html))

Energy Information Administration, (<http://www.eia.doe.gov/>)

Wikipedia, ([http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page))

Measurement Converter, Convertit.com, (<http://www.convertit.com/Go/ConvertIt/>)

Bioenergy Feedstock Information Network, (<http://bioenergy.ornl.gov/>)

Iowa Energy Center, Iowa State University, (<http://www.energy.iastate.edu/>)

Biomass Energy Datebook, U.S. Department of Energy, ([http://cta.ornl.gov/bedb/appendix\\_a.shtml](http://cta.ornl.gov/bedb/appendix_a.shtml))

BP Conversion Factors: <http://www.bp.com/conversionfactors.jsp>

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