

# Conversion base rates

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## INTRODUCTION

S&P Global Platts publishes its assessments and indices reflecting the currencies and units of measurement in which the products typically trade.

Commodities are generally internationally traded in US dollars, and Platts assessments are typically published in that currency as a result. Certain markets, such as regional markets, trade using local currency. Platts assesses the value of such markets as appropriate in local currency.

Commodities typically trade in volumetric or energy units, and Platts assessments for these markets reflect common practice in each market. The units and unit range considered for each individual Platts assessment of a physical market is described in the specification guide for each commodity.

### Measurement systems

Platts employs units of measure from two systems: the International System of Units (the modern form of the metric system); and the US Imperial System. For the SI system, the General Conference on Weights and Measures (CGPM) is the governing body, and Platts uses the definitions provided by the CGPM where possible. For the US Imperial system, the US National Institute of Standards and Technology (NIST) is the governing body, and Platts uses definitions provided by NIST, including conversions from SI units as provided in its publication "Uniform Laws and Regulations in the areas of legal metrology and engine fuel quality".

Within both of these systems, base units are defined for key quantities including mass, length and time. Further units are derived from these bases, including energy and temperature.

### Temperature and atmospheric standards

Measurement of volume of substances is typically associated with a defined temperature and atmospheric standard. However, this standard varies globally. Unless otherwise stated, Platts assessments reflect temperature and atmospheric standards as standard market practice in the location being assessed.

Similarly, units of measure for energy vary according to base units that are defined according to temperature and atmospheric

standards. Platts assessments employ units of measure defined as per standard practice in the market being assessed. For example, in North American natural gas a British Thermal Unit is typically defined as the amount of heat required to raise the temperature of one pound of avoirdupois pure water from 58.5 Fahrenheit to 59.5 Fahrenheit at a constant pressure of 14.73 pounds per square inch.

### Energy-mass-volume conversion factors

For units of measure, individual conversion factors are stated in the specifications guide for each commodity alongside individual assessment codes. Conversions between mass, volume and energy are dependent on the physical qualities of the substance in question, particularly the density and/or energy density. For many commodities, Platts specifies the density of material reflected in its assessments, and seeks to employ that specification in associated energy-mass conversion factors.

However, for some commodities, conversion factors may be based on market convention, rather than an exact representation of the physical properties of the commodity in question.

### Currency conversions

In certain cases Platts converts its assessments to other currencies to allow for ease of comparison or analysis in regional markets. For currencies, such conversions are done using exchange rates published regionally.

### Decimal places and significant figures

Platts typically publishes its assessments to three decimal places. However, conversion factors may require greater degrees of accuracy to ensure non-zero outcomes.

### General conversion tables

Based on the above principles and sources, Platts publishes below a list of conversion factors between US Imperial and SI units for given quantities. In addition to the set of base quantity conversions, Platts also includes a set of conversion calculations between commonly employed factors and units. These conversions should not be taken as applying universally across Platts assessments. Where appropriate, Platts states the conversion factor for assessments published in the relevant specification guide.

**CONVERSION BASE RATES**

|                        |     | Base                       |                        | Inversions |                           |
|------------------------|-----|----------------------------|------------------------|------------|---------------------------|
| <b>Distance</b>        |     |                            |                        |            |                           |
| Inch                   | 1 = | 25.4                       | Millimeter             | 1 =        | 0.03937 Inch              |
| Foot                   | 1 = | 30.48                      | Centimeter             | 1 =        | 0.032808399 Foot          |
| Yard                   | 1 = | 0.9144                     | Meter                  | 1 =        | 1.093613298 Yard          |
| Mile                   | 1 = | 1.60934                    | Kilometer              | 1 =        | 0.6213712 Mile            |
| <b>Area</b>            |     |                            |                        |            |                           |
| Sq inch                | 1 = | 645.16                     | Sq mm                  | 1 =        | 0.001550003 Sq inch       |
| Sq foot                | 1 = | 929.0304                   | Sq cm                  | 1 =        | 0.001076391 Sq foot       |
| Sq yard                | 1 = | 0.83612736                 | Sq m                   | 1 =        | 1.1960 Sq yard            |
| Acre                   | 1 = | 0.00404                    | Sq km                  | 1 =        | 247.525 Acre              |
| Sq mile                | 1 = | 2.58998811                 | Sq km                  | 1 =        | 0.386 Sq mile             |
| <b>Volume</b>          |     |                            |                        |            |                           |
| Cu inch                | 1 = | 16387.1                    | Cu mm                  | 1 =        | 0.000061024 Cu inch       |
| Pint (UK)              | 1 = | 568.26                     | Cu cm                  | 1 =        | 0.00176 Pint (UK)         |
| Pint (US)              | 1 = | 473.176                    | Cu cm                  | 1 =        | 0.00211 Pint (US)         |
| Gallon                 | 1 = | 4.54609                    | Liter                  | 1 =        | 0.219969 Gallon           |
| Cu foot                | 1 = | 28.3168                    | Cu decimeter           | 1 =        | 0.03531 Cu foot           |
| Barrel                 | 1 = | 0.158982512                | Cu m                   | 1 =        | 6.29 Barrel               |
| Kiloliter              | 1 = | 6.28981077                 | Barrel                 | 1 =        | 0.158987295 kiloliter     |
| <b>Mass</b>            |     |                            |                        |            |                           |
| Ounce                  | 1 = | 28.3495                    | Gram                   | 1 =        | 0.035273991 Ounce         |
| Pound                  | 1 = | 0.453592                   | Kilogram               | 1 =        | 2.20462442 Pound          |
| Short ton              | 1 = | 0.907185                   | Metric ton             | 1 =        | 1.102310995 Short ton     |
| Long ton               | 1 = | 1.01605                    | Metric ton             | 1 =        | 0.984203533 Long ton      |
| Long ton hundredweight | 1 = | 0.0508023                  | Metric ton             | 1 =        | 19.68414816 Hundredweight |
| Ounce                  | 1 = | 0.911458                   | Troy ounce             | 1 =        | 1.097143258 Ounce         |
| <b>Speed</b>           |     |                            |                        |            |                           |
| Mph                    | 1 = | 1.60934                    | Kph                    | 1 =        | 0.621371 Mph              |
| <b>Pressure</b>        |     |                            |                        |            |                           |
| Psi                    | 1 = | 0.070307                   | Kg/sq cm               | 1 =        | 14.2233348 Psi            |
| Psi                    | 1 = | 0.0689476                  | Bar                    | 1 =        | 14.50376808 Psi           |
| Psi                    | 1 = | 6.89476                    | Kilopascal             | 1 =        | 0.145037681 Psi           |
| Psi                    | 1 = | 0.070307                   | Atmosphere (technical) | 1 =        | 14.2233348 Psi            |
| Psi                    | 1 = | 0.06805                    | Atmosphere (standard)  | 1 =        | 14.69507715 Psi           |
| <b>Power</b>           |     |                            |                        |            |                           |
| Horsepower             | 1 = | 745.7                      | Watt                   | 1 =        | 0.00134102 Horsepower     |
| Horsepower             | 1 = | 0.7457                     | Kilowatt               | 1 =        | 1.341021859 Horsepower    |
| <b>Energy</b>          |     |                            |                        |            |                           |
| Btu (59 deg)           | 1 = | 1054.8                     | Joule                  | 1 =        | 0.000948047 Btu (59 deg)  |
| MMBtu                  | 1 = | 293.2972222                | Kwh                    | 1 =        | 0.003409511 MMBtu         |
| Therm                  | 1 = | 105.48                     | Megajoule              | 1 =        | 0.00948047 Therm          |
| Btu                    | 1 = | 252.16444                  | Calorie                | 1 =        | 0.003965666 Btu           |
| Boe                    | 1 = | 0.136                      | Toe                    | 1 =        | 7.352941176 Boe           |
| scf gas                | 1 = | 0.0283168                  | Scm gas                | 1 =        | 35.31472483 Scf gas       |
| MMBtu                  | 1 = | 52                         | Mt LNG                 | 1 =        | 0.019 MMBtu               |
| MMBtu                  | 1 = | 28.317                     | Cu m LNG               | 1 =        | 0.035 MMBtu               |
| <b>Density</b>         |     |                            |                        |            |                           |
| API                    | 1 = | 141.50/(API grav + 131.50) | Specific gravity       | 1 =        | (141.50/SG)-131.50 API    |
| Lb/cu ft               | 1 = | 16.0184634                 | Kg/cu m                | 1 =        | 0.06242796 Lb/cu ft       |
| <b>Temperature</b>     |     |                            |                        |            |                           |
| Fahrenheit             | 1 = | -17.222                    | Celsius                | 1 =        | 33.8 Fahrenheit           |

See reference page for full numbers used in calculations.

## REFERENCES

### Source for SI

Bureau International des Poids et Mesures

<https://www.bipm.org/en/measurement-units/base-units.html>

### Source for Imperial

The National Institute of Standards and Technology

<https://www.nist.gov/publications/uniform-laws-and-regulations-areas-legal-metrology-and-engine-fuel-quality>

The National Institute of Standards and Technology

<https://www.nist.gov/pml/nist-guide-si-appendix-b9-factors-units-listed-kind-quantity-or-field-science>

### Btu definition

CME Group

<https://www.cmegroup.com/content/dam/cmegroup/rulebook/NYMEX/2/220.pdf>

### Scf/lb-mole definition

American Petroleum Institute traces

[http://www.api.org/%7E/media/files/ehs/climate-change/2009\\_ghg\\_compendium.pdf](http://www.api.org/%7E/media/files/ehs/climate-change/2009_ghg_compendium.pdf)

### API

U.S. Energy Information Administration

[https://www.eia.gov/dnav/pet/tbldefs/pet\\_pri\\_wco\\_tbldef2.asp](https://www.eia.gov/dnav/pet/tbldefs/pet_pri_wco_tbldef2.asp)

### Sources for boe

Internal Revenue Service

<https://www.irs.gov/pub/irs-drop/n-99-18.pdf>

U.S. Energy Information Administration

<https://www.eia.gov/outlooks/archive/aeo01/pdf/apph.pdf>

### BP

<https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review-2017/bp-statistical-review-of%20world%20energy-2017-approximate-conversion-factors.pdf>

### Sources for toe

#### BP

<https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-approximate-conversion-factors.pdf>

International Energy Agency

<http://www.iea.org/statistics/resources/unitconverter/>

### Source for scf gas

U.S. Energy Information Administration

<https://www.eia.gov/tools/faqs/faq.php?id=45&t=8>

### Source for scm gas

Derived from scf gas