

2015 Annual Report of Gazprom - A mess of conversion factors

The 2015 Annual Report of Gazprom¹ incorrectly converts British thermal units (Btu) to "Russian cubic meters". It means Gazprom executives may have the wrong picture of the European gas market.

Units of Measurement and Conversion Table (page 220) gives two different definitions of cubic meter.

- 1 cubic meter = 1.154 kilograms of coal equivalent, and
- 1 cubic meter = 35714 Btu.

The latter results from the definition of 1 MMBtu = 0.028 mcm (mcm = 1000 cubic meters).

Units of Measurement and Conversion Table

Name	Definition	Conversion
cm of gas	Cubic meter of natural gas measured at 1 atm and 20°C	= 35.316 cubic feet (bcf) of natural gas 1 mcm = 1.154 t c.e.
bbl of oil	Barrel of crude oil	= 0.1364 tonnes of crude oil
bbl of gas condensate	Barrel of gas condensate	= 0.1222 tonnes of gas condensate
BTU	British thermal unit	1 million BTUs = 0.028 mcm of gas = 0.02 tonnes of LNG
tonne of oil	Tonne of oil	= 7.33 bbl of crude oil
tonne of gas condensate	Tonne of gas condensate	= 8.18 bbl of gas condensate
t c.e.	Tonne of standard coal equivalent	= 866.6 cm of natural gas; = 0.7 tonnes of gas condensate; = 0.7 tonnes of crude oil

According to Gazprom, 1 kg of coal equivalent² = 29.3076 MJ = 7000 kcal.

The first option leads to the following calorific value of 1 cubic meter.

1 cub m = 29.3076 x 1.154 = 33.82 MJ or 1 cub m = 7000 x 1.154 = 8078 kcal.

1 Btu = 1.055 J = 252 cal³, so the second option gives the following result.

1 cub m = 37.68 MJ = 9000 kcal.

The heating value calculated through Btu's is 11.4% higher than the one calculated through coal equivalent. So, the same amount of money in the same transaction can buy more or less energy depending on the conversion factor.

¹ <http://www.gazprom.com/f/posts/56/116176/gazprom-annual-report-2015-en.pdf>

² <http://www.gazprom.com/investors/glossary/>

³ <http://www.iea.org/statistics/resources/unitconverter/>

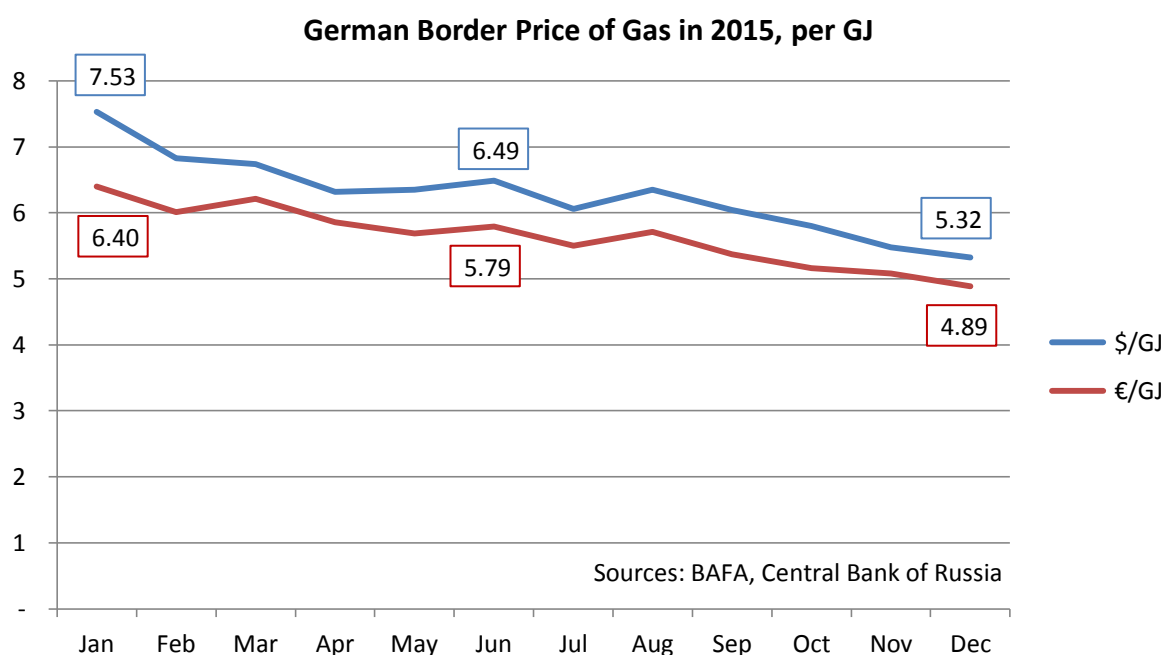
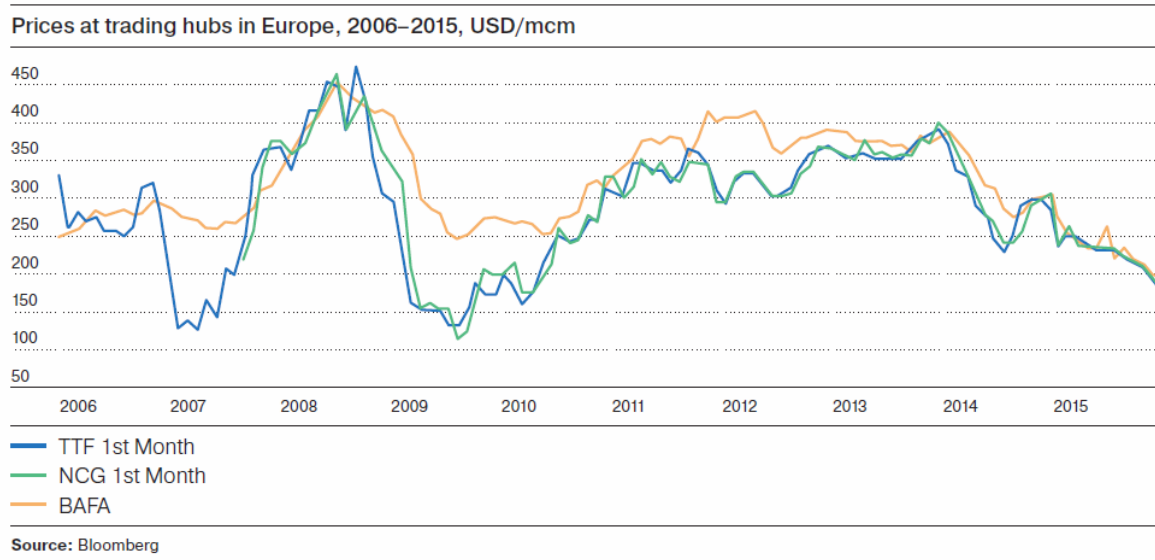
Russian Gas Insight

East European Gas Analysis

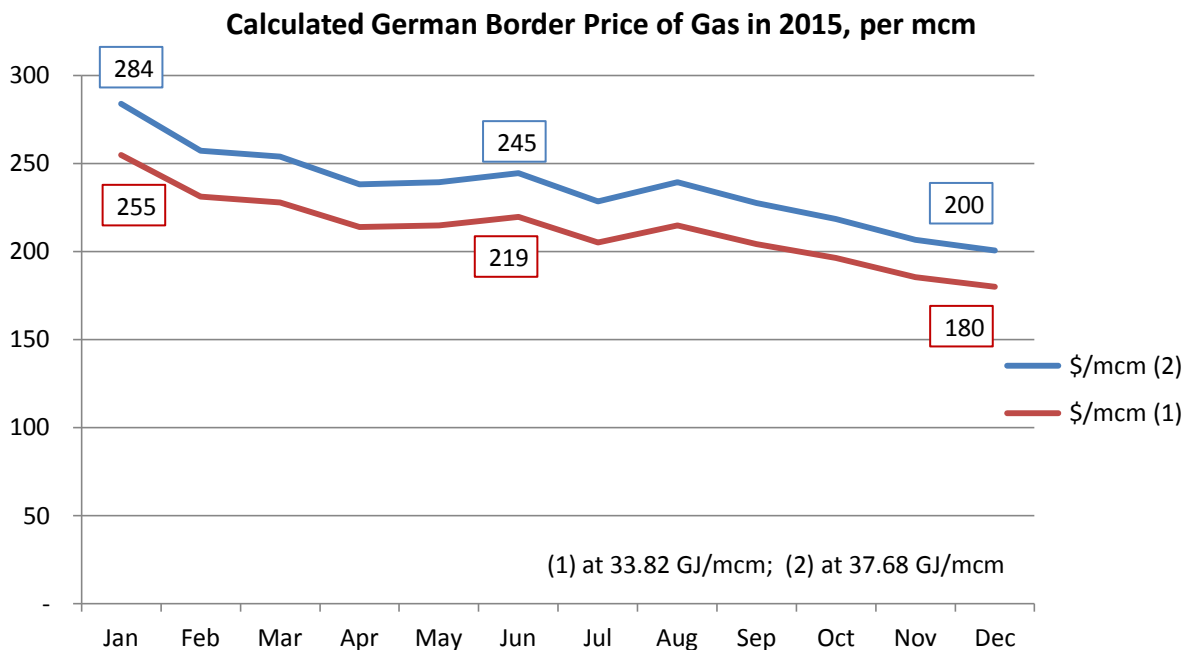
There is another definition of "Russian" standard cubic meter of gas. Numbers of the table on page 52 are "calculated on the basis of International Energy Agency data, natural gas volumes converted to Russian standards (calorific value of 8,850 kcal/cm at 20°C). This is reasonably close to the actual value of 8078 kcal.

As a matter of fact, both Gazprom (in IFRS reports) and the Federal State Statistics Service use the above mentioned standard of 1 cub m = 1.154 kg c.e = 33.82 MJ = 8078 kcal.

Chart "Prices at trading hubs in Europe, 2006–2015, USD/mcm" (page 53) offers yet another conversion factor or a variety of factors. The chart shows a peak of BAFA price in the summer of 2015 with the price exceeding \$250/mcm.



BAFA reported the average import price of natural gas in June 2015 at €5.785/GJ. Using the average exchange rates of the Central Bank of Russia⁴, it can be converted to \$6.49/GJ. The high coefficient of 37.68 GJ/mcm converts the price to \$245/mcm and the low (33.82 GJ/mcm) to \$219/mcm. Note that Gazprom's chart shows the BAFA price peak at above \$250/mcm.



It would be better to have one standard throughout the report with all exceptions marked in the notes of corresponding charts and tables.

Standard cubic meters of the Federal State Statistics Service and IFRS reports of Gazprom are converted to British thermal units as follows.

$$1 \text{ mcm} = 32.056 \text{ MMBtu}$$

Mikhail Korchemkin
 East European Gas Analysis
 Malvern, PA 19355
 USA

Reproduction or use of materials is allowed only with the reference to East European Gas Analysis or www.eegas.com

⁴ http://www.cbr.ru/statistics/print.aspx?file=credit_statistics/ex_rate_ind_15.htm