



## Natural gas in the World - 2009 Edition –

**Published in November 2009, by Cedigaz, “Natural Gas in the World - 2009 Edition” offers a compilation of the main statistical data in terms of reserves, gross and marketed production, the volume of international gas trade by pipeline and by LNG tanker, consumption, prices of the main contracts, LNG infrastructures and underground gas storage. The main trends for the year 2009 have also been reviewed.**

Cedigaz is an international association dedicated to natural gas information. Created in 1961, Cedigaz has more than 150 members in 40 countries. Cedigaz' goals consist in gathering, compiling and analysing worldwide economical information on natural gas, LNG and unconventional gas in an exhaustive and critical way. The information that Cedigaz deals with touches on exploration, reserves, production and processing, transportation, trade, storage, distribution and consumption of natural gas. Cedigaz diffuses this information in its periodic bulletins, surveys and online databases.

### Summary

#### ***A larger amount of global natural gas reserves in 2009***

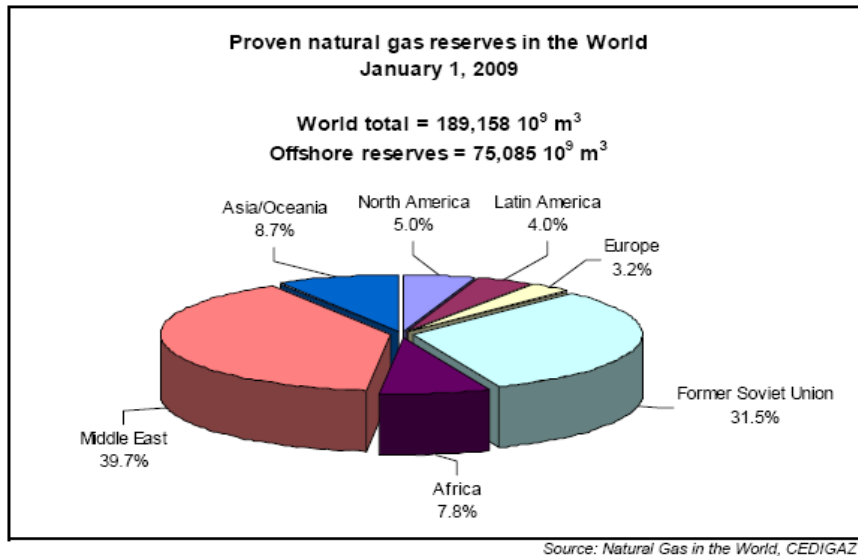
On 1 January 2009, proved natural gas reserves<sup>1</sup> soared by 5.1% over 2008 and were estimated at 189,168 billion cubic metres (bcm), or about  $170.3 \cdot 10^9$  toe. Reversely, proven oil reserves slightly dropped by 0.2% to  $176.1 \cdot 10^9$  toe.

The year 2008 thus witnessed the largest absolute expansion of world gas reserves since seven years. The largest reserve additions were recorded in the four following producing areas:

- The Commonwealth of Independent States (+ 5,772 bcm), as a result of reserves evaluations on some recently-discovered giant fields in Turkmenistan (Yolotan-Osman field, Yashlar field) and reserves extensions in Azerbaijan (Shah Deniz),
- Middle East (+ 1,297 bcm), consecutive to major reserves reevaluations on existing fields in Iran and Saudi Arabia, this latter stepping up a vast exploration program to boost reserves,
- Asia-Oceania (+ 948 bcm), which experienced major discoveries in Australia and to a lesser extent China, in addition to substantial reserves reevaluations in Indonesia,
- North America (+ 790 bcm), due to significant extensions of unconventional gas reserves in the first months of the year in the United States (Northeast, Louisiana) and Canada (British Columbia),

Conversely, European proven reserves pursued their structural decline and dropped 1.5% to 6,077 bcm.

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### **Detailed characteristics of natural gas supply in 2008**

In 2008, marketed natural gas production reached a new record level of 3,065.5 bcm, showing the strongest annual growth in relative terms since 1996, and in volume terms since 1984. This expansion was unusually driven just as well by the dynamism of OPEC, developing and CIS countries, as the main OECD producing countries. The United States, in particular, made a big contribution, thanks to unconventional gas supply. Furthermore, it demonstrated the increased use of non-associated gas reserves, as a result of gas price competitiveness, while oil production only increased 0.4% in the same year.

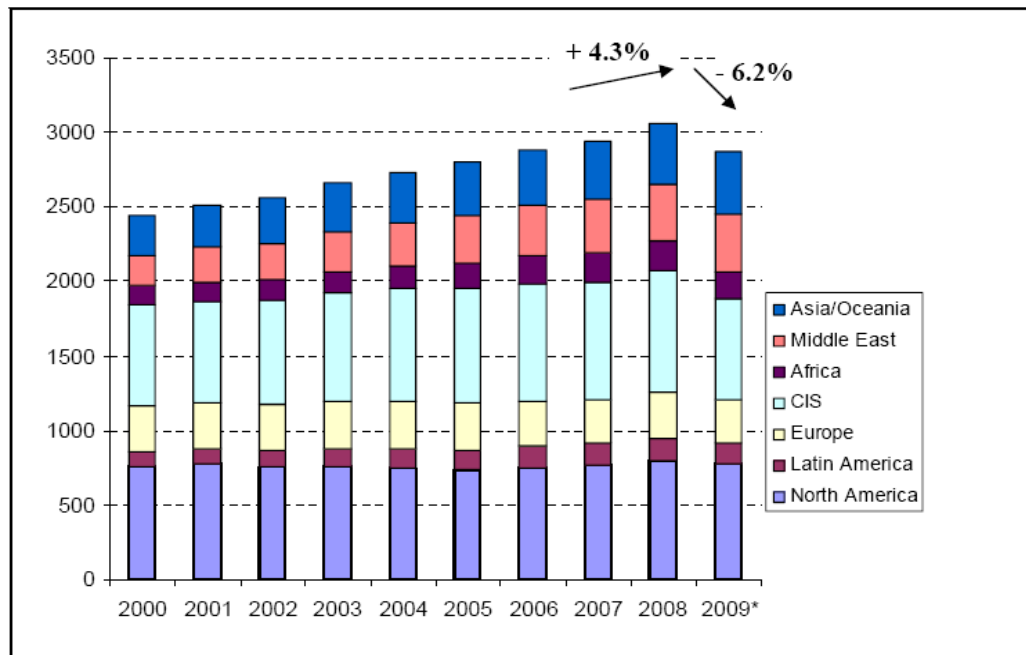
World gross production rose 3.7% to 3,854.4 bcm in 2008, against 3,717.9 bcm in the previous year. With a figure of 440 bcm, quantities of re-injected gas continued to rise (+ 2.1% over 2007) and now account for 11.4% of production, roughly equivalent to the average ratio over the last decade. Forty-two countries conduct re-injection activities today, compared with only thirty-one in 1995. Flaring losses again increased in 2008, going to almost 134 bcm, an annual rise of 4.6%, and now represent 3.5% of the total volume produced. Other losses resulting from the extraction of natural gas liquids amounted to 215.2 bcm in 2008, down 1.8% over the previous year, and now account for 5.6% of world production. The liquefiable fractions of natural gas are an important factor, in North America (70.2 bcm) and OPEC countries (82.8 bcm) in particular, where the equivalent of 9% of their gross production was absorbed by the processing plants.

Offshore marketed production soared 5% to 830.2 bcm, under the impetus of 26 producing countries in every parts of the world, accounting for just over 27% of global marketed production. Offshore production soared 3.7%/year in the last decade, and should continue to grow substantially in the future, raising its share in global production to 30% in 2015 and 35% in 2020, according to CEDIGAZ forecasts.

The 2008 tremendous growth in gas production can be qualified by the following facts. Firstly, it did not reflect the growth in real natural gas consumption (storage variations included) in the same extent, and was actually stronger than this latter, because of larger storage volumes than in the previous year, especially in the OECD and CIS countries.

Global real gas consumption increased by more than 2.5% in 2008, showing a significant expansion worldwide. This latter was explained by both OECD and non-OECD markets and contrasted with the global annual decline in oil consumption for mainly two reasons: the better natural gas price competitiveness in the first half of the year, especially relevant in the industrial and power sectors (Asia, Europe), and colder than normal temperatures in the majority of OECD countries. For illustration, real gas consumption increased 5.7% to 468 bcm in Asia-Oceania and grew 2.4% to 567 bcm in Europe.

### World gas production, 2000 – 2009 (109 m3)



\* Forecast

Source: *Natural Gas in the World*, CEDIGAZ

### **The impact of the economic crisis on world gas supply in 2009**

The production growth in 2008 displayed a sharp contrast between the first and second halves of the year, with strong starts in the first half and bearish activities toward the end of 2008 in parallel with general energy market trends and economic activity. Indeed, the GDP growth amounted to 3% in the first half, followed by a sharp contraction in the final quarter, announcing the worst global economic recession since the World War II.

First results on natural gas consumption trends in 2009 highlight the markets where industrial activity suffered the most from the economic crisis. The strongest declines in real gas consumption in 2009 are indeed expected in Europe (- 8.5%), Russia (- 5%), Japan (- 8.3%), South Korea (-13.5%), Brazil (- 23.5%), and to a lesser extent, OECD North America (- 3.8%).

In 2009, world production should decline deeply, but at contrasting rates in the different geographic areas. World gas supply could fall by 4.5% to 5.5% in 2009. In the mid-range case, the largest production cuts are predicted in the C.I.S (-12.7%), Europe (- 9.7%), Africa (- 7.7%) and Latin America (- 5.5%), while North American production is expected to decline slightly by 0.7%. On the contrary, Asia-Oceania should continue to post sustained and significant growth (+ 3.7%), while the Middle East is poised to present an unusually flat trend, with strong disparities among markets.

### **The international gas trade in 2008**

The international gas trade (including intra-C.I.S trade) grew 4.2% to 970.5 bcm in 2008. This global expansion was only driven by pipeline flows, which soared 5.6% to 744.0 bcm, as LNG flows slightly declined 0.2% to 226.5 bcm. World trade represented 31.7% of world marketed natural gas production in 2008, with LNG accounting for 7.4% of the total, against 7.7% in 2007 and 5.6% in 2000.

The growth in pipeline trade reflects in particular the rising European import needs and the coming into operation of full export capacities from Qatar to the fast-growing markets of the United Arab Emirates. The slight drop in LNG trade was explained by the dramatic cut in United States' LNG imports, which competed with both domestic unconventional production and LNG supply in other markets, such as Japan and Spain. Spot LNG transactions decreased by 9.2% to 41.4 bcm, mainly due to the severe

contraction of US imports. The quantities traded accounted for 18.3% of global LNG flows, compared to 20.1% in the previous year.

### ***Recent trends in international gas prices***

Natural gas prices closely matched the upward and downward trend in the prices of oil in 2008, with time lags for oil-linked gas and LNG prices according to the long-term contracts' formulas. However, the recent increase in oil prices accentuated the gap between Asian, Henry Hub and NBP spot prices, which recently converged down to exceptionally low levels of \$3-4/MBtu, and oil-indexed gas prices, as oil prices recovered to approximately \$13/MBtu in October 2009. This new pattern is not sustainable for a long period and will create much pressure on market players to change or renegotiate pricing formulas in long term contracts, considering that the current surplus of supply may persist in the next three years.

Natural gas should appear on average highly competitive throughout the year 2009, especially against coal in the power sector in OECD countries, while demand destruction in the industrial sector has affected every fossil fuel. Spot gas prices are thus likely to follow an upward trend toward coal prices, taking efficiency differential into account. The multiple advantages of natural gas in the power generation sector, for prices but also environmental and capacity flexibility reasons, only partially limit the negative effects of the economic crisis on gas consumption.

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