KUALA LUMPUR 2012 WORLD GAS CONFERENCE

25th world gas conference

"Gas: Sustaining Future Global Growth"

European natural gas at a crossroads: Where to go from here?

Growth Potential (C3.1)

Study Group C3 (Europe and Russia)

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Wednesday 6 June 2012

Room 406/407 - Kuala Lumpur Convention Centre

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Current Situation - Base Line

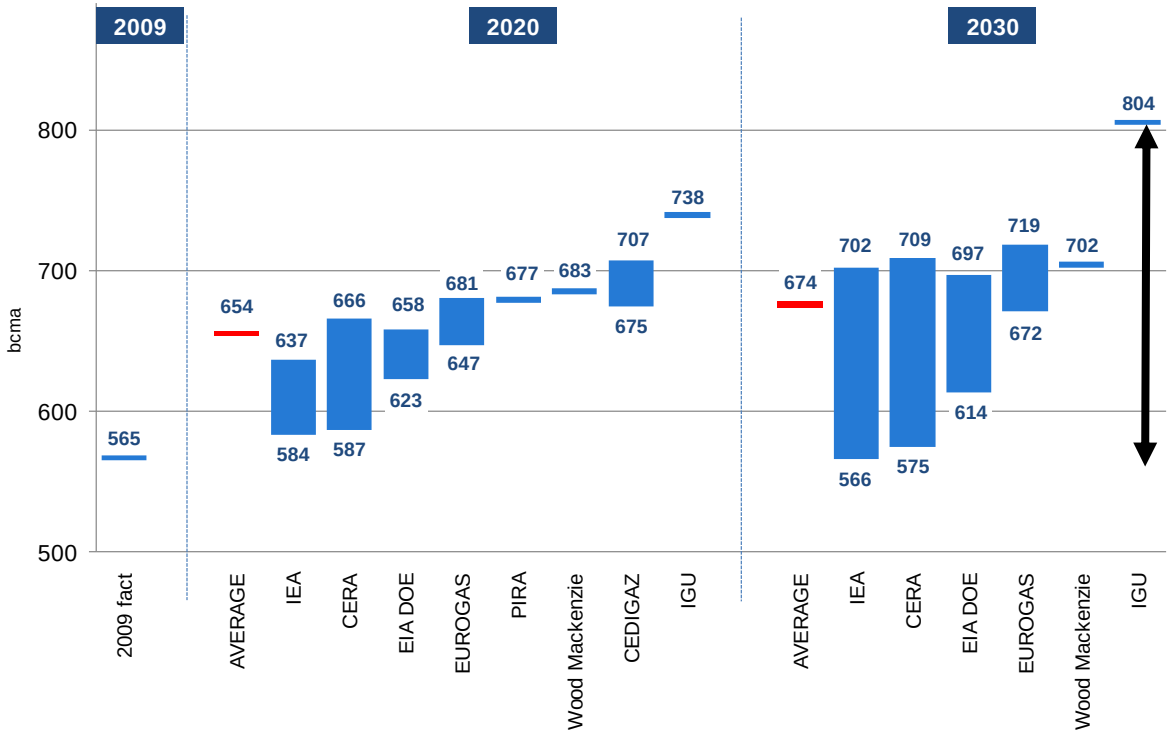
In 2010 consumption recovered and reached 2008 consumption levels

Current Situation - Base Line

- **There is no correlation between GDP and natural gas share in TPES**. Gas consumption predominantly depends on the gas availability .
- **NG exporting countries** have large share of NG in TPES (45% to 86%)
- **Countries/producers** have significant share of NG in TPES ranging between 30 and 40%
- **Countries/importers** have also significant share of NG in TPES , about 40% : either tradition in NG use from domestic gas production or formerly belonging to the USSR
- **Dominant importers** have NG share in TPES up to 20%, The exceptions countries that used to have domestic gas or formerly belonging to the USSR

Growth Scenario

- **European gas market highly developed with small space for significant growth.**



240 bcm differences in 2030.

Even higher differences if producers and consumer forecasts is taken into account

High level of uncertainties that industry have to take into the account when looking at the future gas industry development in Europe and CIS

Key drivers of growth

❖ Technology

- Reduction of fossil fuel dependency and greenhouse gases is an important target in many countries

↑ **Renewables Efficiency**

↓ **Gas consumption**

Subsidized electricity from renewables	Small, highly efficient costumer oriented combined heat and power
Energy efficiency in buildings	Efficient small scale heat pumps and micro cogeneration, or fuel cell
Efficiency and emission in transport sector	CNG vehicle development, and in refilling stations network development

Key drivers of growth

❖ Competitiveness

- Impact of unconventional gas in America on the LNG market – starts to play a role in other markets
- In Europe gas for electricity generation could be key for future growth - Changes in commodity costs could still cause significant swings in gas demand for power
- Existing global gas/LNG price mechanisms can remain in place in the near term - green policies come and unconventional gas development could be a source of renewed pressure
- Change of Europe supply price contracts – shift from oil linked to spot market oriented

Key drivers of growth

❖ Efficiency

- Energy efficiency will increase in all consumption sectors

Households

Increased thermal efficiency: buildings and equipement

Services

Small scale gas engine and adsorption heat pumps
Significant change in the area of air-conditioning

Industry

Large gas absorption heat pumps, micro cogeneration

Improvements in production, steam supply an el. motor

Power

Small and medium combined heat and power (CHP)

Improvements in CCGT technology > 50 %

Decreased specific per unit gas consumption

in driver behind the use of natural gas for power
lower gas consumption results with
increased specific competitiveness of gas

GROWTH

Key drivers of growth

❖ Gas complementarity to renewables

- 20–20–20 initiative
  - 20 % renewables
  - 20 % increase in energy efficiency
  - 20 % less CO_2
- Displacement of fuels in the peak area of the electricity load curve, and less fuels due to the efficiency – lower gas consumption
- Renewables are intermittent - need for balancing energy:
  - gas most suitable for that – fare balancing prices needed (plant short working hours)
- CO_2 reduction - gas cogeneration in short term still ideal solution
- Gas renewables hybrid system - solar thermal, biomass or geothermal systems co-fired with natural gas

Key drivers of growth

❖ CO_2 emissions

- The new EU energy and CO_2 strategy will require significant efforts in technical innovation and investment
- Natural gas appears as a sustainable medium term solution
- At high carbon taxes, natural gas seems to be the most economic option for the construction of CCGT - transparent and market driven valuations of CO_2 emissions needed
- IEA has recognized CNG as a significant alternative to cut down CO_2 emissions in a short to medium term. Natural gas could be particularly important for cutting CO_2 emissions from heavy-duty vehicles.

Key drivers of growth

❖ Natural gas for transport

- Compressed natural gas as a vehicular fuel (CNG)
  - CNG proven and mature technology
  - CNG a perfect option to reduce transportation cost, decrease dependence on oil-products and address a number of environmental concerns
  - CNG in European countries is in most cases two times cheaper than regular gasoline and diesel
  - Larger participation of gas companies into the development of CNG/LNG filling structure, investments in infrastructure in less developed regions, a greater commitment by the car industry are required.
- LNG as a marine fuel can be excellent solution for meeting the MARPOL Annex VI by International Maritime Org. (IMO) targets
- LNG as fuel for heavy duty vehicles - main drivers are price and the ecological advantages of natural gas

Key drivers of growth

❖ Natural Gas as feedstock

- Likely to continue to grow with rising GDP
- Global growth would be fuelled by China, the Middle East and other developing countries in Asia, with consumption relatively flat in both North America and Europe

❖ Micro-generation

- small-scale prod. of heat and/or electricity from a low carbon source
- Technology under development with payback periods range from 3.3 years to 14 years
- The small scale electricity produced could become a new consumption class for natural gas

Key drivers of growth

❖ Side products

- Apart from the obvious management of margins as a key lever for value, side products can bring to the value chain and are: Energy Efficiency Services, Technical Services, Sale of equipments, Cross-selling and up-selling

❖ Power production

- most important driver for natural gas demand in Europe, but with large uncertainties surrounding the corresponding growth
- relative competitiveness of gas when compared with coal and nuclear is not a simple economic matter
- gas can displace coal at higher rates in some countries, and might benefit from a new outlook on nuclear power, but its relationship with wind and other renewable sources is not simple to determine

Key drivers of growth

❖ CONCLUSION

- The Europe and CIS are in most ways mature gas market and most probable modest gas consumption growth levels can be expected in the future
- Future gas growth rates represents high level of uncertainties that industry have to take into the account when looking at the future gas industry development in Europe and CIS

TO REACH GAS OR INCOME VOLUMES GROWTH INDUSTRY SHOULD INVEST MORE IN NEW MARKETS/TECHNOLOGY DEVELOPMENT

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