FLAME CONFERENCE

Where Will New Gas Demand Come From?

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Focus on natural gas demand trends in Europe in the next 5-10 years

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Where Will New Gas Demand Come From?

Focus on natural gas demand trends in Europe in the next 5-10 years

- Lessons from 2015/16: signs of recovery?
- Focus on the main sectors: power, industry, residential and transport
- Conclusions
After 3 years of decline, European natural gas demand increased in 2015 / 2016

- **2016**: 520 bcm in 31 countries (+6% yoy)
- **H1**: mild temperatures reduced demand for space heating was (partly) offset by gas demand for power generation thanks to lower gas prices
- **Q4**: gas demand growth accelerated driven by low temperatures (especially compared to 2015) + gas in the generation mix due to higher coal prices, closure of coal plants and French nuclear issues
Gas demand grew in most countries: the UK and Germany led the trend while Turkish gas demand declined.

- Gas demand was higher in 24 countries out of 31
- The seven biggest gas markets covered more than 80%
  - UK (10 bcm) and Germany (8 bcm) showcased the biggest growth followed by France (4 bcm), Italy (3.4 bcm) and the Netherlands (1.9 bcm)
  - Significant decline in Turkey (-1.4 bcm) and in Romania (-1.3 bcm)

Source: JODI, A. Honoré
Strong growth of gas used in the power sector... Signs of (lasting) recovery??

- 2016: flat electricity demand + growth of renewables in the mix
- Nonetheless: increase of gas deliveries to the power sector, esp. in H2
  - Coal/gas prices competitiveness
  - Coal generation still went up at the end of the year
  - H2: low hydro availability in many countries + low share of nuclear due to significant capacities taken offline
Coal / gas prices: a clear change in gas competitiveness in 2016

Clean spark spreads in selected markets and electricity generation from natural gas in the EU28 (Euro/MWh and TWh)

Clean dark spreads in selected markets and electricity generation from coal in the EU28 (Euro/MWh and TWh)

Sources: Platts, ENTSO-E
The UK as an example for the rest of Europe?
Yes... and no

Carbon price floor in the UK helped to push coal out of the mix and favour gas in 2015/2016

But, the UK market has many specificities that are not necessarily shared by many other markets:
- Carbon price floor price + reactive market
- Large amount of coal and gas in the mix and therefore switching/arbitrage from one to another is possible
- Large amount of coal shut down due to LCPD and continued in 2016
- Somewhat of an “island”
- Low level of renewables

Nonetheless, carbon price is an instrument that works
The next 5 – 10 years: power sector

• No “one scenario fits all” scenario in Europe
  ✷ Each market will have a different story, with various factors at play
  ✷ Existing gas capacity and generation mix (ex. role of gas in the UK vs France/Poland; role of renewables)
  ✷ Active support / dismissal of gas in power (ex. UK vs Turkey)
  ✷ Clear / uncertain signals (ex. nuclear phase out in Germany vs Spain/Belgium)

• Main arguments for gas in power in this timeframe
  ✷ Abundant supply / LNG wave
    • => no security of supply issue to be expected
    • => no return to 2011-2014 prices at least until early to mid 2020s
  ✷ Switching from coal to gas saves CO2 emissions
    • => Use the existing gas fleet (the UK example)
    • => Help to meet the 2020 targets (likely to missed in several countries)
    • => Burning gas is a more efficient way to use a limited carbon budget than burning coal or oil (COP21)

In the next 5-10 years, gas is in a favourable position but it may need to make its case. The main argument should be that it can save emissions NOW by simple switching, even just by using the existing fleet
NOW is the time to make the arguments of immediate benefits

- **About 150 GW of coal capacity in Europe**
  - Less than half have simply opted in the IED
  - Derogated coal plants represent about 82 GW!
    - => TNPs (comply from July 2020)
    - => Limited lifetime derogation (17,500 hours or close by 2023)
    - => Others (DH, local coal burn, accession treaty, isolated markets)
- **With uncertain demand and strong environmental policies, why invest large sums of money to keep these 82 GW of coal plants?**

**Fuel switching from coal to gas needs to be seen as a target or even an instrument: it saves emissions NOW and therefore buys time to develop renewables and energy savings further.**
Impact of the IED: different story country by country

Coal plants with a derogation to the IED (MW)

- About 82 GW of derogated coal plants
  - 56 GW hard coal + 26 GW lignite
  - TNPs: 56 GW, about 16 GW in the UK alone (to be converted by 2020)
  - LLD: 19 GW, about 8 GW in Poland alone (to be closed by 2023)
  - Others: 7 GW

- Closing down coal plants with a derogation would have major impacts in a few countries, not all of them can switch to gas as an alternative (ex. Poland)

Not all these plants can easily be closed in our timeframe, but potentially up to 50 GW (?) could be shut in the next 5+ years
Potential for large amount of firm capacity to close down in the next 5 – 10 years

- Coal plants
  - IED impacts (ex. UK, Poland, Spain, Cz Rep, Romania, Greece...)
  - National policies (ex. UK, Germany, Netherlands, France...)

- Nuclear plants
  - Phase out / lower share (ex. Germany by 2022; uncertainties on others)
  - Economic shut down (ex. Sweden)
  - Delays for new nuclear (ex. UK)

- The gap between power demand and how much renewables can fulfil could widen quickly (in the next 5 years)
  - => Much will depend on how the gap is filled and how big the gap is
  - => Possible role for gas, but it will need to make its case: a carbon price at the national level (in this timeframe) may be necessary

Possible role for gas in the next 5-10 years if massive switching happen. It could place gas in a much better position for the longer term, but it will still need to deal with its carbon status (CCS, green gas...).
In 2016, industrial production continued its rising trend that started in 2013. Stronger growth rates were registered in key markets such as Germany, with positive impacts on gas demand, but also in Turkey and Poland.
The next 5-10 years: industrial sector

• Peaked 2000, in decline since then

• Key issues limiting gas demand growth in this timeframe:
  - Recession and economic situation
  - Energy savings and efficiency measures
  - Structural changes of the industry sectors: shift to less gas-intensive sectors
  - Technological improvements: less gas used in production process
  - Saturation of the market in many countries

• In the 5-10 years: (some) GDP recovery and lower gas prices will benefit natural gas, but impacts will be limited
  - Small growth possible in a few markets, such as Germany and in Central/Eastern/Southern Europe (incl. Turkey), but unlikely elsewhere

Except in a few markets were small growth may happen, at the regional level, gas demand in the industrial sector will be flat or in decline by the end of the period
The next 5-10 years: residential sector

• Most unpredictable year-on-year
  - Large annual / seasonal variations

• Key issues limiting gas demand growth in this timeframe:
  - Peaked 2010
  - Rise in gas prices to households contributed to lower (suppress?) demand
    • Decoupled from income growth, this will accelerate
    • Also decoupled from population growth/living space
  - Energy efficiency measures => low process, but impacts already
  - Heat decarbonisation => probably most impact post 2030, but some countries have already started
  - Public acceptance of gas vs renewables should not be underestimated
    • Renewables will increase in the residential (and industrial) heating
  - Decentralised generation => hard to estimate, but growing factor

No growth expected, except maybe in a few countries, but (large) potential seasonal variations to remain
The next 5-10 years: transport sector

- Fastest growth rate but from a very low base

- Key issues contributing to gas demand growth:
  - Level of awareness of the damage caused by atmospheric pollution continues to increase
  - Diesel bans are planned/proposed in several cities
  - Most activity is likely to occur in the marine and HGV sectors
    - October 2016: Implementation of IMO 0.5% global cap on sulphur content in marine fuels
    - => positive for new build LNG vessels in all markets
    - => new bunkerships being built, small scale bunkering at terminals including floating bunkering facilities, etc.
  - CNG developments for passenger vehicles uncertain (EVs preferred)
  - Rail is seen as a potential market but volumes are small

Fastest growth rate, but from a very low base
Large potential for LNG in marine, but this is likely to be slow

Source: C. LeFevre (OIES)
Conclusions

• 2015 / 2016 growth: not necessarily a sign of recovery
  - Weather, coal plants closures, nuclear/hydro problems, coal/gas prices

• The next 5-10 years: up or down?
  - Black box in many scenarios or wide range of opinions, no consensus
  - The next 5-10 years will be (could be?) different from the longer term ‘future of gas’ debate
  - Reasons to believe gas demand could stay high in this timeframe:
    • Power: coal to gas switching using existing gas plants would help alleviate CO2 emissions NOW; replace firm capacity closures (partly) by gas plants
    • Industry/residential: less potential but some growth possible in key markets
    • Potential for transport will depend on political commitment, but it may happen outside of this timeframe
  - VERY different outlook and trends to be expected country by country!

• 2025/2030+
  - Different debate: transition / destination / future of gas
    • IF large coal/nuclear to gas switching in power happens in the next 5-10 years, could this place gas in a different (stronger?) position?
  - Still, there will be a necessity to decarbonize gas (all sectors)
    • Green gas / CCS?
Thank you for your attention!

For additional discussions on natural gas demand, see:

- Natural gas demand in Europe: the next 5-10 years, A. Honoré, OIES, Forthcoming June 2017, www.oxfordenergy.org

If you have any comments or questions, please contact:
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