The Golden Age of Gas in Europe is probably behind us

Dr Pierre Noël
EPRG, University of Cambridge
pn243 [at] cam.ac.uk

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EPRG, University of Cambridge

Economic & social science research in energy markets & policy –
*electricity, gas and carbon.*

Supported by the UK Research Councils and a group of Corporate Members:
Key points

• 35 years post-1965 have been a golden age for European gas -- *But it came to an end around 2003-4*

• Leading projections see continued (if slowing) growth in European gas consumption, driven by the power sector

• They show continued import growth, LNG and pipeline, with a significant contribution from Russia

• This is questionable, on the demand and supply side alike
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1960s-2000s – The Gasification of Europe

Source: BP Statistical Review (2011)
Gas v. Primary Energy

Source: BP Statistical Review (2011)
Europe catches up with World, OECD, US

Source: BP Statistical Review (2011)
Diversity in reliance on natural gas

- EU15
- EU27
- NMS 12
- Hungary
- Romania
- Italy
- Netherlands
- Lithuania
- UK
- Latvia (*)
- Slovakia
- Rep. Ireland
- Austria
- EU15
- EU27
- Germany
- Denmark
- NMS12
- Belg.+Lux
- Spain
- Czech Rep.
- France
- Estonia (*)
- Finland
- Portugal
- Bulgaria
- Poland
- Slovenia (*)
- Greece
- Sweden
- Cyprus (*)
- Malta (*)
## Cumulative energy, 1970-2010

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU27 Gas Consumption</td>
<td>12.4 Gtoe</td>
</tr>
<tr>
<td>EU27 Nuclear Consumption</td>
<td>5.8 Gtoe</td>
</tr>
<tr>
<td>EU27 oil consumption</td>
<td>28.3 Gtoe</td>
</tr>
<tr>
<td>EU27 hydro consumption</td>
<td>2.8 Gtoe</td>
</tr>
<tr>
<td>Saudi oil exports</td>
<td>14 Gtoe</td>
</tr>
<tr>
<td>US oil imports</td>
<td>16.2 Gtoe</td>
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Has gas demand peaked in Europe?

Source: BP Statistical Review (2011)
IEA & BP (and others) think no

2010-2030

• Consumption up by 100bcm
  – Idem IEA ‘Golden Age’
• Conv. prod. down by 100bcm
  – IEA‘Golden Age’: -70bcm
• About 40bcm shale+CBM
• Imports up by 160bcm
  – IEA‘Golden Age’: 140bcm
• Pipeline imports grow nearly as quickly as LNG imports
• Power is key to demand growth – mainly through fuel substitution
Gas in power generation

- Current economics look bad
  - Stagnant GDP – falling power demand
  - Reserve margins high; spreads low
  - Gas price rally of 2010 brought coal back
  - New CCGTs do not break-even in CWE or UK market
The case for fuel substitution

Carbon pricing is supposed to incentivise coal-to-gas substitution

Big prizes are in PL, CZ, DE, UK

IEA data
Growth in gas for power? (2/4)

- Questioning the gas-for-CO2-reduction story
  - Inter-fuel competition is heavily “managed” in Europe
  - EU has effectively abandoned its climate policy in favour of a renewables policy – *not the same at all*
  - Coal is protected by low carbon price & subsidies
  - Gas may be the big loser -- Cf Spain
Spain: wind and coal displace gas

“It is nice how gas complements wind in the Spanish market”
-- EC official

Investors in stranded CCGTs will appreciate…
Growth in gas for power? (3/4)

- “Energy security” concern do not favour gas
  - Central Europe (PL + CZ) – politics of Russian dependence
  - a dash for gas very unlikely – they will wait for nukes
  - UK – Preventing a new dash for gas is a permanent theme of public discourse (including by ministers)
    - One driver of the Electricity Market Reform
      - LT feed-in-tariff contracts for all low-C, incl. nuclear
Growth in gas for power? (4/4)

- Policy-driven fuel substitution
  - UK -- compelling mid-term case for new CCGTs
    - 9GW coal to drop in 2015 (LCPD)
    - Carbon Price Floor will support gas v. coal
    - But longer-term the policy would drive gas out
    - Unreliable base-load (wind) will incentivise OCGTs
  - France – don’t bet on a nuclear exit
    - The French (partial) exit from nuclear is as solid as the German nuclear life-extension – an oil / gas crisis will bring nuclear back (‘Fukushima in reverse’)
    - However, winter gas generation is growing in FR
Gas generation in France

Gas-fired electricity in France

Source: ENTSOe
What does it all mean? – The case of UK

- Decline in residential (efficiency) & industrial
- Long-term subsidy contracts to renewables + nuclear
- Gas demand slowly declining, at best

Source: National Grid, Ten Year Statement 2011
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Europe = 20% of global gas consumption

Source: BP Statistical Review (2011)
Europe ‘gasified’ through imports

Bubble surface proportionate to gas consumption

Gas imports as % of gas consumption

Gas as % of primary energy

Figures for 2010

Source: BP Statistical Review (2011)
Since 1975, 100% of growth covered by imports

Sources: International Energy Agency; BP Statistical Review of World Energy
LNG accelerated diversification

- Qatar
- Yemen
- Malaysia
- Trinidad
- Oman
- Norway
- Egypt
- Nigeria
- Algeria

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Europe imports half of world traded gas

<table>
<thead>
<tr>
<th>Year</th>
<th>EU27+TR Gas Imports</th>
<th>% of world trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>6.4 Mtoe</td>
<td>29%</td>
</tr>
<tr>
<td>1980</td>
<td>67 Mtoe</td>
<td>57%</td>
</tr>
<tr>
<td>1990</td>
<td>130 Mtoe</td>
<td>56%</td>
</tr>
<tr>
<td>2000</td>
<td>200 Mtoe</td>
<td>46%</td>
</tr>
<tr>
<td>2010</td>
<td>321 Mtoe</td>
<td>51%</td>
</tr>
</tbody>
</table>

Excl. intra-FSU & intra-EU trade.
Source: BP Statistical Review
Growing imports from Russia?

- IEA, BP, etc., project significant expansion of pipeline imports, including growing Russian exports to Europe
- 1970s-1980s – explicit commercial contracts made under an ‘implicit political contract’ – *keep gas separate from foreign policy*
- This ‘enabling contract’ did not survive the cold war – *great paradox…*
- Mr Putin’s foreign (and gas) policy, in a context of EU enlargement, has divided Europe and created an ‘implicit security tax on gas’
- Commoditisation would help depoliticise, but Russia does not seem enthusiastic
- Can imports grow nonetheless?
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Conclusions: for gas demand to grow...

At least some of the following would have to happen

- Some economic growth
- A return to a carbon (not renewables) policy -- *fuel mix determined by relative costs including carbon price*
- An efficient pan-European gas market, reducing the ‘gas insecurity syndrome’ in Central & Eastern Europe
- Fully commoditised Russian gas – *sold at hub price; disconnected from Russia’s foreign policy; some level of competition upstream*
- A European unconventional supply boom

New golden age of gas – *likely for the world; unlikely for Europe*