Security of European Gas Supplies: issues for the UK

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Main Arguments

- The majority of gas security discussion is related to increasing import dependence – but this is only a part of the current and future problem.
- There is a “new security environment” for European gas which is significantly different to what has gone before.
- Risks of a major UK gas security incident have increased significantly but this relates to fragility of domestic infrastructure and lack of storage, not increasing import dependence.
What Was The Old Environment for European Gas Supplies?

- Reserves: where are they, are they enough for 10, 20, 50, 100 years?
- Technology: do we have/could we develop technology to bring pipeline and liquefied natural gas to markets: deep water, long distance
- Cost versus price: could projects be developed at a cost which would be covered by the prices which buyers/customers would be willing to pay?
- How would we deal with the “supply gap” which would evolve over the next 10-20 years?
Components of the “New Security Environment”*  

- Indigenous gas reserves and production  
- Foreseeable limits on Russian exports  
- Reduced likelihood of Middle East, Caspian (and possibly North African) pipeline supplies  
- Limitations of West African LNG  
- Development of a “Gas-OPEC”  
- Failure of liberalisation and competition in Continental Europe?  
- Domestic security issues require as much (more?) attention as international  
- Atlantic/global competition for LNG supply  
- Competition from China and India?  

Indigenous European Gas Supplies

Present knowledge of UK, Norwegian, Dutch and other Continental European gas reserves, suggests that indigenous European production will not increase beyond 2010, and are likely to decline after that date; this decline is likely to accelerate after 2015.
Natural gas (and general political) relations between Russia and Europe (and Russia and the US) have entered a period to increasing difficulty. After the two North European pipelines – bringing Russian export capacity up to 200 Bcm (~160 Bcm in 2005) – a limit on exports will be reached:

- from the European perspective because of fears of over-dependence (and worsening political relations with Russia)
- from the Russian perspective because of:
  - general tightening of Gazprom’s supplies
  - future profitability of the Russian market may make European exports less attractive
  - emphasis on diversification of export markets to Asia (and North America) using “stranded” gas in Eastern Siberia/Far East (and the Barents Sea)
### Middle East and North African Gas Exports to 2004-2030 (Bcm)

<table>
<thead>
<tr>
<th></th>
<th>TO EUROPE</th>
<th>TOTAL EXPORTS</th>
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<tbody>
<tr>
<td>M. East</td>
<td>2</td>
<td>35</td>
</tr>
<tr>
<td>N. Africa</td>
<td>61</td>
<td>83</td>
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<tr>
<td>TOTAL</td>
<td>63</td>
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**Major Exporters:**

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
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<tbody>
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<td>Qatar</td>
<td>19</td>
<td>78</td>
<td>126</td>
<td>152</td>
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<tr>
<td>Algeria</td>
<td>64</td>
<td>76</td>
<td>114</td>
<td>144</td>
</tr>
<tr>
<td>Iran</td>
<td>-</td>
<td>5</td>
<td>31</td>
<td>57</td>
</tr>
<tr>
<td>Egypt</td>
<td>-</td>
<td>10</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>Libya</td>
<td>1</td>
<td>2</td>
<td>13</td>
<td>34</td>
</tr>
<tr>
<td>Iraq</td>
<td>-</td>
<td>1</td>
<td>7</td>
<td>17</td>
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Source: IEA, WEO 2005, (Reference Scenario)
Possible Middle East and North African Exports to Europe

- Resources – no problem
- Absolute volume increases are optimistic (30-40 years to reach current levels)
- Very optimistic share of MENA exports to come to Europe (42-50% of Middle East LNG, 85% of North Africa); North Africa will have pipelines dedicated to Europe
- Six countries account for 90% of total exports in 2030; Algeria and Qatar = 70-90% of exports 2010-30

How realistic are these projections?
Middle East Gas Exports - reality

Middle East countries – especially Iran and Qatar – have substantial gas reserves BUT:

- Europe will be in competition with Pacific and US markets for Qatari LNG
- there is a 30 year history of potential ME pipeline projects – with no results
- political problems with Iran have prevented pipeline and LNG trade over the past 30 years; Iran has a very bad contractual track record as a gas supplier eg exports to Turkey

Large scale (ie 100 Bcm/year) Middle East pipeline gas supplies to Europe currently unrealistic in any time frame
Proposed Caspian Pipelines: Nabucco

Source: OMV
West African LNG

- Nigeria is the potential giant with more than 110 Bcm of exports by the mid-2010s if all projects are realised but: political instability, institutional capacity??
- Other West African exporters (Angola, Equatorial Guinea: much smaller and have similar problems

Nigeria will be a key large scale (eg up to 100 Bcm/year) source of additional gas supply if political instability can be managed
An OPEC for gas? Or for LNG?

- The Gas Exporting Countries Forum: so far not an “OPEC-type” organisation but a “discussion forum”
- Galvanised by objections to EU (and national) liberalization
- Currently a chaotic organisation with unstable membership and development prospects
- Prime movers are LNG exporters: Algeria, Qatar, Iran, Trinidad, therefore an organisation for LNG exporters is more likely than gas exporters

Unlikely to be effective for at least a decade especially if high prices continue
Continental European Liberalisation and Competition: an unlikely outcome?

- Nearly 20 years of negotiations, legislation and regulation have produced results on a spectrum between “unsatisfactory” and “extremely disappointing”

- Continental European governments are creating a “Champions League” of utilities likely to limit the competition/competitiveness agenda

- “security” provides an excuse to defend this model at the expense of liberalisation and competition

Does liberalisation matter for security? UK versus Continental European views
Gas Security: perceptions versus empirical evidence

- Widespread assumption that imported gas is less secure than domestic supplies and infrastructure has little empirical basis.
- The most serious gas security incident in Europe in 2006 was not the Russia-Ukraine crisis:
  - the fire at the UK’s Rough storage reservoir in April
  - Uncertainties in some countries caused by a colder than usual winter
- How much gas has ever been stopped by “political instability”?

Ageing and unreliable infrastructure may become a very important problem.
North American Gas and Atlantic Basin LNG

- North American production is declining, can production be stabilised in a high price environment?
- Significant additional indigenous gas is available from Alaska and the Canadian Arctic but lead times – especially for Alaska - are more than a decade; commercial/environmental/regulatory obstacles remain
- LNG will be the principal source of incremental gas until Arctic gas arrives; 130 Bcm of regasification capacity is under construction and proposed

The US will be a major competitor in Atlantic Basin LNG markets for at least a decade
The Pacific Region: a global LNG competitor for Europe?

- Short term Indonesia supply crisis means that traditional Pacific buyers – Japan and Korea (possibly Taiwan) will compete for Middle East supplies and for marginal/seasonal cargoes from other Atlantic Basin suppliers.
- China and India will not dominate Pacific (and certainly not global) LNG trade and will only peripherally compete with Europe for gas. Politics is preventing them from accessing their “natural supplies” through pipes.

Projections of “a global LNG market” are ahead of reality but the TREND is real.
Supply/demand cycles over the next decade

- Shortage cycle likely to end in 2007/08 with arrival of new gas
- Surplus cycle likely from 2008-12 (maybe up to 2015) depending on power demand and Atlantic Basin LNG, BUT...
- Prices may stay high because of oil linkage and lack of liberalisation and competition
- Winters may still see high prices

Demand impact of high oil/gas prices likely to ensure that 2008-15 is a time of surplus but post-2015 becomes “interesting”
The New Gas Security Environment: worsening geopolitics, increasing LNG competition

- there are significant uncertainties from where Europe will receive substantial additional gas supplies post-2020
- Europe is increasing obsessed with “unreliable and nasty foreigner” theories of energy security but the real problem is…
- political relationships between Europe and major gas exporters – particularly Russia and the Middle East (except Qatar) – are in decline
- significant competition between Europe and the US for LNG is building in the Atlantic Basin

Domestic and international politics, and geopolitics, will determine all of the crucial outcomes for European gas supplies
Wider Energy/Electricity Consequences of the New Security Environment

THESE GEOPOLITICAL PROBLEMS CAN BE RESOLVED OVER THE NEXT DECADE BUT IF THEY ARE NOT, THE MAIN CONSEQUENCE WILL BE THAT:

- there will not be sufficient gas for the substantial anticipated increase in gas-fired power generation and therefore...
- gas will not be able to play any significant role in carbon reduction in the power sector
- European gas market will stabilise and decline post-2020
The Dti/OFGEM view that the UK market model has shown that it can attract new investment in new supplies and storage is correct, but only part of the security story:

- not only did the winter 2005-06 price volatility create major costs for consumers
- but in 2006, the UK had the biggest gas security crisis in its history with the accident at the Rough storage; a major gas crisis was only avoided by luck
## New Supplies into the UK (up to 100 Bcm/year?)

### South Hook LNG
- 10.5 bcma

### South Hook Expansion
- 10.5 bcma

### Dragon LNG
- 6 bcma

### Grain LNG
- 4.4 bcma

### Grain Expansion
- 10.5-14 bcma

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![Map of UK with LNG terminals and expansions](image-url)

- **FLAGS**
  - +4 bcma
- **Vesterled**
  - 15 bcma
- **Langeled**
  - +25 bcma
- **BBL**
  - +15 bcma
- **IUK**
  - 8+8+8 bcma
UK Gas Security: short term outlook/longer term issues

SHORT TERM OUTLOOK: once we get through this winter, everything looks fine and oversupply is the most likely outcome for the next several years so, are the Dti/OFGEM right – did “the market” solve the problem?

LONGER TERM QUESTIONS:

- the UK got through last winter and may get through this one on a “wing and a prayer”, but is this acceptable for a country which depends on gas for ~50% of non-transport energy demand? Gas supplies have not arrived “just in time” but 2 years too late – is this ok?
- has “the market” solved the gas storage problem?
Gas Storage Issues for the UK

COMMERCIAL STORAGE ie storage owned by market players to cover seasonal and operational problems:
- currently insufficient to cover more than a few days of demand
- significantly smaller than for other European countries (for historical reasons)
- significant planning obstacles to new storage sites

STRATEGIC STORAGE ie storage to cover catastrophic events of low probability but high impact – currently none and not anticipated

Are there better measures: more LNG, mandatory distillate back-up for CCGTs, access to Continental European storage?
Commercial Storage Problems

- Storage is insufficient to cover more than a few days of high demand (or supply/infrastructure outage) and – even if all the storages currently planned are built – will remain extremely limited.
- Storages are generally taking a long time to build due to local objections and planning inquiries; lead times are such that if there is a need for substantial new storage in the mid 2010s planning needs to begin very soon.
- Commercial players are unlikely to want to build substantial storage at a time over oversupply to anticipate the next market cycle.
Is Strategic Storage Needed?

IN FAVOUR:

- for a country with very high dependence on gas through complex infrastructure, the risks of a catastrophic supply failure, while small, need to be insured against because the consequences could be devastating

AGAINST:

- “cost and risk of unintended consequences of such a policy outweighs potential benefits” ie strategic storage will interfere with market forces and reduce the incentive for commercial players to invest in storage
- decision as to who will build, own, operate and release strategic storage will interfere with market signals
UK Gas Security: most likely outcomes

2007-10: (barring a crisis this winter):
- oversupply and lower prices allow self-congratulation that “the market has worked” in relation to supply security
- some additional storage likely to be built but not sufficient to support even commercial requirements of cold weather, let alone catastrophic infrastructure failure
- little significant progress on back-up fuels for CCGTs, let alone strategic storage

After 2010:
- increased dependence on gas + difficulties in the international environment will refocus the problem
- but “window of opportunity” for planning/building storages will have been squandered by inaction