Gas Insecurity: A Figment of the Imagination?

Peter Davies. Chief Economist, BP EPRG. Cambridge. 19 May, 2006
Gas Security

- What is it?
- Does the UK have it?
- What is going to change?
- What can we do about it?
Energy Security

Consumers

Resources

Available

Reliable

Affordable

Price

Sustainable

Clean

Climate

Footprint

Producers

Markets

Fair
Gas security is the availability of reliable supplies at a reasonable price – in a sustainable manner.
# National Grid Gas Balancing Alert History

<table>
<thead>
<tr>
<th>Gas Day</th>
<th>Update Timestamp</th>
<th>Description</th>
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Source: National Grid
Reasonable Prices?

NBP Platts 24hr/Day Ahead

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<th>$/therm</th>
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<td>2006</td>
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Reasonable Prices?

UK NBP vs. US Henry Hub

US$/mmbtu

- NBP
- HH

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Sustainability

- Clean
- Low CO$_2$
- No significant production or transportation externalities
Future Gas Security

- What does the market think?
Natural Gas: Henry Hub vs NBP

$/mmbtu

Actual

Futures

Henry Hub

NBP

Jan-04 Apr-04 Jul-04 Oct-04 Jan-05 Apr-05 Jul-05 Oct-05 Jan-06 Apr-06

Jun-06 Jul-06 Aug-06 Sep-06 Oct-06 Nov-06 Dec-06 Jan-07 Feb-07 Mar-07

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Future Gas Security

- What does the market think?
- What is changing?
UK Gas Supply and Demand

Source: BP Statistical Review of World Energy 2005
New Pipeline Import Capacity

Interconnector Expansions

Balgzand-Bacton (BBL)

Ormen Lange
LNG Import Terminals

Dragon & South Hook LNG Terminals Milford Haven

Isle of Grain LNG Terminal in Kent

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Global LNG Growth

LNG volumes (mtpa) existing, in development, probable and speculative

Expected total LNG

- Russia
- Norway
- Peru
- Bolivia
- Venezuela
- Trinidad
- Angola
- Guinea
- Nigeria
- Algeria
- Libya
- Egypt
- Yemen
- UAE
- Oman
- Iran
- Qatar
- Malaysia
- Indonesia
- Brunei
- Australia
- US

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Future Gas Security

- What does the market think?
- What is changing?
- What could happen?
Continental European Gas Liberalisation
Catastrophic Risks

Accident

Nature

Terrorism

Interruption

The Risks and Danger of LNG

A Film by Tim Riley and Hayden Riley

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UK Natural Gas Storage

Mcm

- Rough
- Medium Range Storage
- Short Range Storage

May-05 to Apr-06

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Policy Options

- Fuel choice interventionism – nuclear, renewables
- EU policy
- Storage:
  - Mandatory storage
  - Capacity market
- Long term contracts
Conclusions

- The UK has had gas security
- Imports will rise but import capacity will rise even more
- International gas market developments to support UK security even though the depth of EU liberalisation remains uncertain
- UK gas security should be maintained – but catastrophic interruptions pose a risk, as they do to all energy markets
- Gas storage can provide some insurance, at a cost. Debate over strategic storage is valid.
UK net exports and gas in storage

Net exports (MCM) vs. Gas in Storage

© BP 2006
UK Interconnector Flows

Monthly maximum export capacity

Monthly maximum import capacity (expanded in December 2005)

Million cubic meters/d

© BP 2006
Total UK gas in storage

Mcm

- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006

January
February
March
April
May
June
July
August
September
October
November
December
**UK gas import capacity expansion**

<table>
<thead>
<tr>
<th>Project</th>
<th>Capacity</th>
<th>As % 2005 consumption</th>
<th>Date</th>
<th>status</th>
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<tbody>
<tr>
<td>Isle of Grain phase II</td>
<td>Increase from 12 to 38Mcm/d</td>
<td>9.1%</td>
<td>2008</td>
<td>Planning permission granted</td>
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<tr>
<td>Interconnector import capacity (phase II)</td>
<td>Increase to 66Mcm/d</td>
<td>6.6%</td>
<td>Dec. 2006</td>
<td>Under construction</td>
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<tr>
<td>Bacton – Balgzand interconnector</td>
<td>27Mcm/d</td>
<td>9.4%</td>
<td>Dec.2006</td>
<td>Under construction</td>
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<tr>
<td>Milford Haven – Dragon LNG</td>
<td>16.5Mcm/d</td>
<td>5.8%</td>
<td>4Q2007</td>
<td>Under construction</td>
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<td>Milford Haven – South Hook</td>
<td>29Mcm/d</td>
<td>10.1%</td>
<td>2007</td>
<td>Under construction</td>
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<td>Langeled – Ormen Lange gas</td>
<td>Up to 70Mcm/d</td>
<td>24.4%</td>
<td>2007/08</td>
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<td>Statfjord late life gas project – via FLAGS pipeline</td>
<td>14Mcm/d</td>
<td>4.9%</td>
<td>2007/08</td>
<td>Under construction</td>
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<td><strong>Total</strong></td>
<td><strong>202.5Mcm/d</strong></td>
<td><strong>61%</strong></td>
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Source: DTI, PIRA, Norsk Hydro and Statoil.
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<thead>
<tr>
<th>Project</th>
<th>Capacity</th>
<th>Date</th>
<th>status</th>
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<tbody>
<tr>
<td>Humbly Grove</td>
<td>280Mcm</td>
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<td>Aldbrough storage</td>
<td>420Mcm</td>
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<td>Welton storage facility</td>
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<td><strong>Total</strong></td>
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*Source: DTI, Star energy.*