GCC Domestic Gas Consumption and the Outlook for Exports

Professor Jonathan Stern
Chairman and Senior Research Fellow
Natural Gas Research Programme
Oxford Institute for Energy Studies

Middle East and North Africa Energy 2012,
Chatham House, January 30-31, 2012
GCC Gas Reserves (end 2010)

<table>
<thead>
<tr>
<th>Country</th>
<th>PROVEN RESERVES (Tcm)</th>
<th>R/P RATIO (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuwait</td>
<td>1.78</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Oman</td>
<td>0.70</td>
<td>25.5</td>
</tr>
<tr>
<td>Qatar</td>
<td>25.3</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>8.0</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Bahrain</td>
<td>0.2</td>
<td>16.7</td>
</tr>
<tr>
<td>UAE</td>
<td>6.0</td>
<td>&gt;100</td>
</tr>
</tbody>
</table>


Plenty of reserves; production just over 6%pa, demand just under 6%pa 2007-10

Saudi Arabia Natural Gas Sector

- **Upstream and Trade**
  - Proven gas reserves: 7.57 trillion cubic meters (mainly associated);
  - Disappointing recent exploration results
  - Current policy of no exports/no imports
- **Rapid increase in domestic demand**
  - 1970: annual consumption of natural gas less than 2 billion cubic meters (bcm); 2010: 76 bcm; 150 bcm by 2030.
  - Sources of use: Power generation, petrochemicals, water desalination, oil sector, industry
  - Share of natural gas in total domestic energy consumption: 25% in 1980, 45% in 2004-2008; plan for 50% of domestic energy mix
- **Gas at heart of the diversification efforts**
  - Diversion of gas into petrochemicals which have effect of adding “highest possible value to the Saudi economy”
  - Employment generation and global competitiveness issues
- **Decrease in share of gas in power generation and water desalination**
  - Capacity expansion will be fuelled by liquids
Crude Oil Increasingly Used in Power-Generation


Bahrain likely to become a new importer of gas

- Low own oil and gas reserves and increasing gas demand means that, Bahrain is becoming a permanent importer of gas
- Heavy reliance on gas for economy due to absence of oil as alternative for the past 20 years

Source: Production - EIP (2005); Consumption - Ministry of Finance (2009)
Kuwait is relying on LNG, rather than pipeline, imports

- Oil and gas industries are further inter-related through the large share of gas used for reinjection in the oil industry: 45%
- LNG imports were originally just to meet summer peak power demand. Contract with Shell & Vitol has secured supply the next few years
- Other import options Iran, Iraq and Qatar have proven unsuccessful so far and are unlikely to be suppliers to Kuwait in the near future
- New domestic production under development (cost??)

LNG imports rose from 0.9 Bcm in 2009 to 2.8 Bcm in 2010

Qatari LNG: a huge success story

Fourteen trains will bring Qatar LNG export capacity to 105 Bcm by 2012.
By 2012 Qatar will have a fleet of 69 vessels, 10 of which can load simultaneously at Ras Laffan Port.

Key success factors include:
- Very large, low cost, gas resource
- Strong clear leadership and decision making has facilitated the expansion so quickly
- Partnering strategy to bring expertise, experience and finance
- Integrated project structures aligned Qatari and foreign partner interests

But also pipeline gas (Dolphin) exports, GTL, petrochemicals, industry, power, etc.
Exports to rise to 104 Bcm by 2012; debottlenecking can increase this to 120 Bcm by 2018 (assuming moratorium relaxed)

Qatari LNG Exports (mtpa): reaching plateau in 2012


The Dolphin Gas Project

370km pipeline from Ras Laffan to Abu Dhabi then 180 km to Fujairah and Oman

Started June 2007, reaching full 56.6 Mcm/day in 2008

Strong commercial structure and sovereign support

Dolphin provides “the proper conditions that enhance economic and political ties amongst GCC countries”

Other regional countries (Bahrain & Kuwait) sought gas through Dolphin expansions. Phase 2 expansion difficult to justify

- Regional customers only willing to pay substantially less than international markets
- Current Dolphin-Abu Dhabi price of $1.30/MMBtu will not be replicated
Qatari LNG exports 2012: the end of expansion?

- Moratorium in place until at least 2014/5
  - the earliest date that the studies on the performance of the North Field will be complete
  - Projects have been deferred
  - Low cost de-bottlenecking of the mega-trains will add 12 mtpa LNG once the moratorium is lifted
  - Not certain that the Government will sanction new LNG trains post-moratorium; even then no additional exports before 2020 meanwhile....

- Flexible marketing strategy to optimise the value of its portfolio.

Oman Gas: domestic demand and EOR have priority over exports

- Shortage of gas in Oman
  - Power & gas intensive petrochemical and fertiliser projects
  - Lower volumes of domestically produced gas

- Priority is power, followed by EOR
- Transparency in the power sector with an independent regulator. Gas sector is opening up more slowly
- New reserves are being sought – but at what price?
- LNG exports maintained at a level that only meets long-term contracts
Oman has closely examined options of importing gas and concluded that it is unlikely that large volumes of reliable gas will be available at prices which will be attractive.

Oman Gas – Encourage new exploration and realism about raising prices

- The cost of new gas has increased - >$3.50/MMbtu
  - domestic gas prices are low and are likely to remain so
  - difference will be borne by government
  - possibility of blending new higher cost gas with older cheaper gas
- Government policy will continue to focus on gas for power and domestic use. Additional export volumes not possible
- Focus domestically and the government will agree realistic pricing and fiscal terms with investors that will encourage exploration
United Arab Emirates, gas demand will exceed supply by 90 bcm in 2018

- The region’s 5th largest gas reserves, and the 4th largest gas producer (39.5 Bcm)
- The UAE is a net importer of gas and Northern Emirates are still short of gas:
- High energy demand rates for gas, electricity, desalinated water, due to subsidised tariffs, high population growth rates, construction boom and energy-intensive industries
- Sour gas development has been problematic
- Alternative energy supplies, inc. nuclear power, will only solve part of the issue – pricing and awareness will be essential future factors
- LNG export contract expires in 2019- will it be extended?

GCC Gas Exports: a bleak outlook

- Saudi Arabia – no imports/no exports; no likely change but imports are possible
- Kuwait – already importing and likely to increase
- UAE – net importer
- Bahrain – LNG imports later this decade?
- Oman – significant new production needed to prevent LNG export decline
- Qatar – the end of export expansion in 2012

With the exception of Bahrain, all of these countries have major reserves of gas
What Can Be Done: Supply Side Actions

Promote/attract more investment in the upstream:
- Improvement of upstream investment terms
  - Politics/“resource nationalism”
- Reduce bureaucracy and institutional inefficiency/instability
  - NOCs “hostages” of government politics

Increase regional trade:
- Concerns of energy security (Qatar-Saudi Arabia, Iran and the rest of region)
- Commercial terms/expectations

Develop alternative sources of energy: solar + nuclear
- Timescale/know-how/safety/politics
- Costs/subsidies/pricing policies

The Political Problématique of Domestic Gas Pricing

Low gas prices are part of the “social compact” between government and population; their origins are in associated gas which was low cost or “free”.

This compact requires governments to:
- develop non-oil industry and increase employment eg petrochemicals
- improve access to modern energy supply
- distribute oil and gas rents
- apply these criteria not just to gas prices but also power and water which is…
- very important socially and politically for countries with large populations in lower income groups
What Can Be Done: Demand and Price Actions

Feedstock (and power) pricing policy:
- Policy of maintaining low gas prices at $0.5-1.5/MMBtu is unsustainable (prolonging distortions and inefficiency);
- Subsidies need to be gradually removed – Iran and Bahrain have made the boldest efforts yet – politically very painful;
- Failure to do so will result in worsening supply crisis, further curtailment of exports and increase in subsidies (Qatar excepted);

Reconsider petrochemical expansion plans:
- How much added value to the economy/employment?
- Looming global petrochemicals glut?

By 2015, prices need to be raised to cost-based levels, and by 2020 to international levels; if not rationing gas (and power) will be the only alternative

Thank You

OIES GAS PROGRAMME RESEARCH IN PROGRESS IN THIS AREA (forthcoming 2012):

The Pricing of Internationally Traded Gas, ed. Jonathan Stern

The Iraqi Gas Sector: prospects and development challenges, Hakim Darbouche