The Impact of the 2008-09 Recession and Economic Crisis on Russian and European Gas Markets

Professor Jonathan Stern
Oxford Institute for Energy Studies

IEEJ, Tokyo
February 9, 2010
OIES* Natural Gas Research Programme

WE ARE: a gas research programme at an independent academic institute, part of Oxford University, specialising in fossil fuel research

WE ARE NOT:

- consultants
- sellers of exclusive, high price business reports

WE PRODUCE: independent research on national and international gas issues

WE ARE FUNDED BY: sponsorship by companies and governments in gas producing and consuming countries

Information about our Institute, our Programme and its publications can be found on our website: http://www.oxfordenergy.org/gasprog.shtml

*Oxford Institute for Energy Studies is an educational charity
THE RUSSIAN GAS MARKET
Russian GDP Growth Rates: 1961-2009

Highest levels of economic growth in post-war period

Soviet times

Source: Federal State Statistics Service, Ministry for Economic Development

GDP fell by 7.9% in 2009
Russian Industrial Production, 2002-09

Source: Federal State Statistics Service, IEF estimates
Note: seasonally adjusted data

Industrial output down 10.8% in 2009, but up 2.7% in the year to December
2009: THE HARDEST YEAR IN GAZPROM’S HISTORY

- Gas production 462 bcm, the company’s lowest ever
- Big fall in European and CIS export sales
- TWO “GAS WARS”:
  - January dispute with Ukraine: Gazprom lost $100m + per day, and its reputation suffered in Europe
  - No Turkmen gas imported from April-December 2009
### Russian gas production 2004-09 (Bcm)

<table>
<thead>
<tr>
<th>Source: Gazprom</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAZPROM</td>
<td>545.1</td>
<td>548.4</td>
<td>556.0</td>
<td>548.6</td>
<td>549.7</td>
<td>462.2*</td>
</tr>
<tr>
<td>OTHER PROD’ERS</td>
<td>88.4</td>
<td>92.2</td>
<td>100.2</td>
<td>104.1</td>
<td>113.9</td>
<td>120.2*</td>
</tr>
<tr>
<td>TOTAL RUSSIA</td>
<td>633.5</td>
<td>640.8</td>
<td>656.2</td>
<td>652.7</td>
<td>663.6</td>
<td>582.4*</td>
</tr>
</tbody>
</table>

*preliminary figures

2009: Russian production fell by nearly >80 Bcm; Gazprom production fell by nearly 90 Bcm; independent production increased
But Some Companies Increase Production

NOVATEK:
- 32 Bcm in 2009 – potential to grow rapidly
- A powerful new part-owner (Gennady Timchenko)
- 50.1% of Yamal LNG
- Supply contracts with OGK-1 power company

THE OIL COMPANIES:
- Priority for associated gas in Gazprom’s pipelines meant that most maintained production in 2009
- Rosneft contesting third-party access case

Is the Russian government making space for non-Gazprom output to increase?
### Production and Import Projections 2009-12

<table>
<thead>
<tr>
<th>Bcm</th>
<th>2008 actual</th>
<th>2009 prelim</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GAZPROM</strong></td>
<td>549.7</td>
<td>462.2</td>
<td>529</td>
<td>532</td>
<td>542</td>
</tr>
<tr>
<td>(Source: Gazprom*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL RUSSIA</strong></td>
<td>663.6</td>
<td>582.4</td>
<td>643</td>
<td>655</td>
<td>669</td>
</tr>
<tr>
<td>(Source: MinEcDev’t**)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OTHER RUS. PRODUCTION</strong>*</td>
<td>113.9</td>
<td>120.2</td>
<td>114</td>
<td>123</td>
<td>127</td>
</tr>
<tr>
<td><strong>CENTRAL ASIAN IMPORTS</strong></td>
<td>61</td>
<td>33.6</td>
<td>32.8</td>
<td>33.9</td>
<td>37.9</td>
</tr>
</tbody>
</table>


Gazprom/Russian production does not regain 2008 levels till 2012
Central Asian supplies

TURKMENISTAN:
- Chinese exports have started (~ 6bcm in 2010)
- $10bn (Chinese and Middle Eastern) investment agreed for Yolotan
- Exports to Iran could increase
- ‘Up to 30 Bcm’ to Russia in 2010 = 10 Bcm, probably

UZBEKISTAN AND KAZAKHSTAN:
- Uzbekistan: 15.5 Bcm to Russia in 2010
- These purchases fit with Russian foreign policy

Russia/Gazprom retains a strategic interest... but in the early 2010s has limited need for Central Asian gas
Balancing Supply with Demand

- Medium term Gazprom’s production increase will depend on Yamal Peninsula (Bovanenkovskoye field) development
- Gazprom has announced:
  - a one-year delay for Yamal – now end-2012 (instead of 2011)
  - and a 3-year delay for Shtokman

HOW MUCH additional supply will Gazprom need AND WHEN?

- Answer depends on when demand for Russian gas recovers: in Russia, in CIS, in Europe...
- and on independents’ role
Yamal-Nenets Gas Fields and Pipelines
Rethink on Shtokman due to US price outlook?
DOMESTIC DEMAND: fell between -4% to -6.6% = 21-28 Bcm
CIS MARKET: Ukraine alone down 15-20 Bcm; Belarus 3-4 Bcm, Moldova another 1-1.5 Bcm

Russia and CIS demand fell 40-55 Bcm in 2009

WILL 2010 BE BETTER?
## Russian domestic gas prices 2008-09

**Russian Fed’n Avge Group 4, all data ex. VAT), assuming $1 = 29RR**

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDUSTRY:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price/mcm</td>
<td>2059</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>2389</td>
<td>82</td>
</tr>
<tr>
<td><strong>HOUSEHOLD:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price/mcm</td>
<td>2030</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>2388</td>
<td>82</td>
</tr>
<tr>
<td><strong>Netback European Price</strong></td>
<td>4349</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>6642</td>
<td>229</td>
</tr>
<tr>
<td><strong>Gazprom EU price</strong></td>
<td>10202</td>
<td>352</td>
</tr>
<tr>
<td></td>
<td>11485</td>
<td>396</td>
</tr>
</tbody>
</table>

*FTS formula equalising domestic and export prices for Nizhnegorodsk oblast **10/08-7/09

Source: Russian Federal Tariff Service

---

**Russian domestic prices remain around one third of netback export prices (even using FTS methodology). But subsidies have been largely eliminated**
<table>
<thead>
<tr>
<th>Country</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006*</th>
<th>2007*</th>
<th>2008*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine</td>
<td>26.0</td>
<td>34.4</td>
<td>37.6</td>
<td>59.0</td>
<td>59.2</td>
<td>56.2</td>
</tr>
<tr>
<td>Belarus</td>
<td>10.2</td>
<td>10.2</td>
<td>19.8</td>
<td>20.5</td>
<td>20.6</td>
<td>21.1</td>
</tr>
<tr>
<td>Moldova</td>
<td>1.5</td>
<td>1.9</td>
<td>2.8</td>
<td>2.5</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Caucasus</td>
<td>0.5</td>
<td>0</td>
<td>6.9</td>
<td>7.6</td>
<td>3.1</td>
<td>2.8</td>
</tr>
<tr>
<td>Kazakhst’n</td>
<td>-</td>
<td>0.8</td>
<td>4.0</td>
<td>6.5</td>
<td>10.0</td>
<td>9.6</td>
</tr>
<tr>
<td>TOTAL CIS</td>
<td>38.2</td>
<td>47.1</td>
<td>71.1</td>
<td>96.1</td>
<td>95.6</td>
<td>92.4</td>
</tr>
</tbody>
</table>

Sources: Gazprom in Figures 2004, p.30, Annual Reports: 2004, p.47; 2005, p.55; 2006 p.49; 2008 p.51. *includes RosUkrEnergo re-exports; statistical basis of data is different to previous years

2009 exports were less than 60 Bcm
Russia/Ukraine: another gas war in 2010?

REASONS FOR:

- Ukraine could reopen price negotiations
- Yanukovich could resurrect RosUkrEnergo (unlikely)
- The IMF-backed cash flow could be interrupted

REASONS AGAINST:

- The IMF will likely still see Ukraine as a “domino that must not fall”, whoever is president
- The new president will be less antagonistic to Russia

Ukraine is paying European netback prices. But it will struggle to pay at this level without IMF assistance
### Russian Export Prices to CIS Countries ($/mcm)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>actual</td>
<td>estimated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>130</td>
<td>180</td>
<td>231</td>
<td>295*</td>
</tr>
<tr>
<td>Belarus</td>
<td>118</td>
<td>127</td>
<td>151</td>
<td>168</td>
</tr>
<tr>
<td>Moldova</td>
<td>170</td>
<td>236</td>
<td>238</td>
<td>233*</td>
</tr>
</tbody>
</table>

*Q1 Prices only

Export prices intended to reach “European” (netback) levels by 2011 – for Ukraine 2010; 2-3 times higher than Russian domestic prices.
### Gazprom’s Gas Exports to Europe: consolidated and actual (Bcm)

<table>
<thead>
<tr>
<th>Year</th>
<th>Western Europe</th>
<th>Eastern Europe</th>
<th>Baltic States</th>
<th>TOTAL (consolidated)*</th>
<th>Actual**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>75.1</td>
<td>42.3</td>
<td>4.4</td>
<td>121.8</td>
<td>147.0</td>
</tr>
<tr>
<td>2000</td>
<td>90.3</td>
<td>38.7</td>
<td>4.7</td>
<td>133.7</td>
<td>151.1</td>
</tr>
<tr>
<td>2005</td>
<td>113.2</td>
<td>42.9</td>
<td>5.0</td>
<td>161.1</td>
<td>150.5</td>
</tr>
<tr>
<td>2006</td>
<td>118.0</td>
<td>43.5</td>
<td>5.2</td>
<td>166.7</td>
<td>158.8</td>
</tr>
<tr>
<td>2007</td>
<td>128.6</td>
<td>39.4</td>
<td>5.3</td>
<td>173.8</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>141.0</td>
<td>42.5</td>
<td>4.1</td>
<td>188.5</td>
<td></td>
</tr>
</tbody>
</table>

*consolidated IAS figure including all gas sold by Gazprom affiliates in Europe; **actual Russian gas volumes exported to Europe

2009 – 140.2 Bcm actual (preliminary)
2010: 160.8; 2011: 163.5; 2012: 170.9 Bcm
Short term outlook post-recession

- Recovery of gas sales/exports and production – depends on economic/gas demand recovery

- Gazprom’s short term decisions:
  - Hold back Yamal development and allow independents/Central Asia to fill any gap?
  - Raise prices to CIS countries and accept demand reduction?
  - Maintain traditional European price formula and see others take market share?

Even if Ukraine problems do not recur, this is a bleak short term outlook; Gazprom must take very difficult decisions
Medium/longer term outlook

- Yamal development and independent production: no major availability problem?
- Caspian/Central Asia will be strategically important but volumes much less than expected at least up to 2015
- Realistically before 2020 no significant Russian gas to China or North America (unless market conditions change radically)

Gazprom “export diversification” strategy looks doubtful before 2020, but domestic and CIS markets could look more attractive than in the past
EUROPEAN GAS MARKETS
### Demand in Europe 35 - 1990 to 2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe 35</td>
<td>100.00</td>
<td>2.44</td>
<td>1.95</td>
<td>n/a</td>
<td>1.17</td>
<td>n/a</td>
</tr>
<tr>
<td>Germany</td>
<td>16.32</td>
<td>1.78</td>
<td>1.11</td>
<td>1.67</td>
<td>-1.12</td>
<td>-2.06</td>
</tr>
<tr>
<td>UK</td>
<td>16.86</td>
<td>2.98</td>
<td>-0.35</td>
<td>-0.38</td>
<td>-0.31</td>
<td>-1.20</td>
</tr>
<tr>
<td>Italy</td>
<td>14.46</td>
<td>3.29</td>
<td>2.30</td>
<td>1.71</td>
<td>1.79</td>
<td>-0.23</td>
</tr>
<tr>
<td>NL</td>
<td>8.23</td>
<td>0.59</td>
<td>-0.13</td>
<td>0.10</td>
<td>-0.77</td>
<td>-1.58</td>
</tr>
<tr>
<td>France</td>
<td>7.82</td>
<td>2.74</td>
<td>1.81</td>
<td>1.49</td>
<td>0.65</td>
<td>-2.24</td>
</tr>
<tr>
<td>Spain</td>
<td>6.50</td>
<td>11.43</td>
<td>10.92</td>
<td>10.16</td>
<td>10.41</td>
<td>8.41</td>
</tr>
<tr>
<td>Turkey</td>
<td>6.33</td>
<td>14.09</td>
<td>12.17</td>
<td>12.33</td>
<td>11.91</td>
<td>11.54</td>
</tr>
<tr>
<td>Total Big 7</td>
<td>76.52</td>
<td>3.17</td>
<td>2.10</td>
<td>2.08</td>
<td>1.42</td>
<td>0.02</td>
</tr>
<tr>
<td>Total EU27</td>
<td>90.83</td>
<td>2.11</td>
<td>1.42</td>
<td>n/a</td>
<td>0.53</td>
<td>n/a</td>
</tr>
<tr>
<td>TOTAL Europe 35</td>
<td>100.00</td>
<td>2.44</td>
<td>1.95</td>
<td>n/a</td>
<td>1.17</td>
<td>n/a</td>
</tr>
<tr>
<td>Total 19</td>
<td>91.86</td>
<td>3.13</td>
<td>2.08</td>
<td>2.09</td>
<td>1.30</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

Source: A. Honore, forthcoming 2010, Oxford University Press

**Slow down of gas demand growth pre-dated recession**
Gas demand slowed in mid 2008, declined in late 2008... and continued to fall into 2009
Certainty about the future gas demand has changed over the past few years... What about 2008-2015 ???

EC scenarios for natural gas demand in EU27 by 2020 (bcm)

- **Observed demand**
- **EC Baseline 61$/bbl**
- **EC Baseline 100$/bbl**
- **EC New Energy Policy Proj. 61$/bbl**
- **EC New Energy Policy Proj. 100$/bbl**

Gas Supply and Import Capacity

- European domestic gas production is flat or declining BUT:
- Major pipeline infrastructure is under construction: Nord Stream, Medgaz
- More pipelines planned: South Stream, Nabucco, Galsi
- Major new LNG capacity has just opened or is under construction in: UK, France, Italy, Netherlands and others

Weak and uncertain demand makes it very difficult for buyers to sign new long term take or pay contracts
Oversupply/weak demand highlights a lack of economic logic in gas pricing

CONTINENTAL EUROPE long term contracts:

- traditional netback market pricing based (largely) on oil products is no longer logical because:
  - gas and oil product markets have diverged
  - very little switching capacity remains
- gas prices are under increasing pressure due to supply surplus

Market growth requires change in pricing; but major producers do not want change!
Oil linked prices likely to rise above Euros 20/MWh in 1H/10, hub-based prices likely to remain steady or even fall
For LNG to divert to US, Henry Hub must be >40c higher than NBP
Possible Steps in the Transition Away from Oil-Linked Pricing

- Hub based pricing seems the most likely outcome:
  - either NBP-based or average of NW Europe
- What kind of contractual transition measures are most likely:
  - an increasing % of spot gas in the base price and index;
  - “temporary relief” envisaging return to oil linkage in the future;
  - relaxation of Take or Pay?

The trade-off for producers/exporters is between accepting lower base prices/indexation to spot prices, or relaxing Take or Pay and allowing buyers a choice of sources.
Short term outlook post-recession

GAS SURPLUS DUE TO:

- Likely weak demand recovery in 2010-11
- Surge of new LNG supplies; north west Europe already increased LNG imports in 2009 due to price differentials

THIS WILL CAUSE:

- Take or Pay problems in long term gas contracts until 2011-12

- Increasing competition means that major importers can no longer force LTC gas on customers at twice the price of spot gas
- Oil-indexation is becoming an increasing problem
Medium and longer term outlook

- Indigenous production and ACQ levels of contracted pipeline gas can cover demand up until 2014
- Long term contract pipeline gas + LNG below demand post 2016
- Uncertainties on future demand recovery (crisis & 20/20/20 policies), but post 2014, supply/demand balance tightens due to:
  - accelerating decline in Europe production
  - plateau in pipeline import potential (~2014),
  - post 2014-15 is also the period when LNG supply growth slows down

Around 2015 market may change from surplus to shortage (perhaps within a short time?)