Future Gas Market Dynamics in Europe: is it all about Russian pipeline gas versus US LNG?

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AGENDA

• Europe: can the gas demand recovery of 2015/16 be sustained?
• ‘Security’: perceptions and reality
• Gazprom pipeline gas versus US LNG: competitive positions
• Different time frames
Gas Demand in 31 European Countries 2010-2016 (bcm)

Honoré: OIES (forthcoming)

2016 saw first non-temperature corrected increase in demand since 2008; demand in 2014 was back at early 1990s levels
Many countries increased their demand but some did not eg Turkey and some central/eastern countries

Source: Honoré/OIES
As coal prices increased and gas prices fell in 2016, so CCGTs came into the money, especially in UK which has a high carbon support price

Clean spark spreads in four major EU markets and electricity generation from natural gas in the EU28 (Euro/MWh and TWh)

Source: Honoré/OIES
If COP 21 targets are going to be achieved, demand decline is modest for the next decade but very significant post 2030.
European Gas Security: perception versus reality

PERCEPTION: Russia is the major problem of European gas security:
For many Europeans: Gas = Gazprom/Putin = Bad: this is generally presented as an `energy/gas security problem’ but in many cases is a metaphor for Russophobia/Putinphobia ie national/military security

REALITY:
• European gas production is declining – by 2030 European gas production will be ~100 Bcm (43%) less than in 2014; low gas prices may mean this happens faster than anticipated; new production likely to be uncompetitive at low gas prices
• Diversification of pipeline gas has failed:
  ◆ North Africa: export prospects are poor
  ◆ Southern Corridor: 16 Bcm west of Turkey in the early 2020s is maximum (and could be less)
  ◆ East Mediterranean: political gridlock
  ◆ European shale gas: failed – politically toxic
• LNG can disappear in the 2020s if Asia needs it
Projected conventional gas production decline 2016-2030 (Bcm)

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<th></th>
<th>2016</th>
<th>2020</th>
<th>2030</th>
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<tbody>
<tr>
<td>Norway</td>
<td>122</td>
<td>100 (87-111)</td>
<td>75 (57-90)</td>
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<tr>
<td>UK</td>
<td>41</td>
<td>34</td>
<td>20</td>
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<tr>
<td>Netherlands</td>
<td>53</td>
<td>38 (33-42)</td>
<td>26 (20-30)</td>
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<tr>
<td>Other</td>
<td>40</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>256</td>
<td>212 (194-227)</td>
<td>146 (122-165)</td>
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挪威、荷兰和英国将继续主导欧洲的天然气生产，预计2020年与2016年相比将减少29-62 Bcm（“平均”情景下约17%），到2030年将减少91-134 Bcm（“平均”情景下约43%）。荷兰的产量下降可能比这里展示的要快得多。

Norwegian, Dutch and UK will continue to dominate European conventional gas production, which will decline 29-62 bcm (about 17% in the “mean” scenario) by 2020 compared to 2016 and by 91-134 bcm (about 43% in the “mean” scenario) by 2030. **DUTCH DECLINE COULD BE FAR MORE RAPID THAN SHOWN HERE**
Gazprom has a surplus of gas, mainly targeting Europe

- Russia’s total supply capacity to western markets is c.750-800bcm
- Western demand for Russian gas = 620bcm (excluding sales from Sakhalin)
- Independent production is dedicated to domestic market or specific LNG projects
- Gazprom therefore has a shut-in gas production of around 100 Bcm which has been largely created by its decision to invest in the Yamal peninsula during the mid-2000s
- As the majority of the investment has already been made, the gas can be priced down to short run marginal cost if necessary

Source: Henderson/OIES
### Gazprom Pipeline Gas Exports to Europe 2011-2016 (Bcm)

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<tr>
<td>Western Europe</td>
<td>115.9</td>
<td>111.4</td>
<td>133.6</td>
<td>126.8</td>
<td>130.0</td>
<td>146.3</td>
</tr>
<tr>
<td>Eastern* Europe</td>
<td>40.7</td>
<td>39.6</td>
<td>40.8</td>
<td>32.6</td>
<td>28.6</td>
<td>33.0</td>
</tr>
<tr>
<td>Baltic States</td>
<td>5.1</td>
<td>4.8</td>
<td>4.2</td>
<td>3.9</td>
<td>4.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Total (Group)</td>
<td>161.7</td>
<td>155.8</td>
<td>178.5</td>
<td>163.3</td>
<td>188.4</td>
<td>228.3</td>
</tr>
<tr>
<td>Total LTC**</td>
<td>150.0</td>
<td>138.8</td>
<td>161.5</td>
<td>146.6</td>
<td>158.6</td>
<td>179.3</td>
</tr>
</tbody>
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*Includes “other countries” which rose to 5-6 Bcm in 2014-15; **volumes exported under long term contracts by Gazprom Export excluding Baltic states. Sources: Regional totals are sum of individual countries exports from Gazprom in Figures 2010-14, pp.82-3 and 2011-2015, pp.81-2. Gazprom Annual Report 2014, p.49 and 77. 2016 data from Gazprom Press Conference June 2017.

**2016 was a record year for Russian gas exports**
Nord Stream & Nord Stream 2 Pipelines

Nord Stream: 55 bcm (in two strings): operational since 2011-12
Nord Stream 2: 55 bcm (in two strings): scheduled ~Q4 2019
Nord Stream 2 faces formidable political and regulatory obstacles making the 2020 start date unlikely (but not impossible)

Source: OIES
The Turkish Stream Pipelines

First pipeline will start laying imminently, completion by end-2019 likely; 2nd pipeline depends on EU regulation and pipeline capacity options
• On a short-run marginal cost basis (SRMC) the key variables are the US$/Rouble exchange rate and the price of Henry Hub gas
• At current price levels Russian gas can compete with, and slightly undercut, US (and all except Qatari) LNG in Europe
• Longer term, Russia would logically adopt a strategy to keep the European gas price between the short and long-run cost of US LNG - $4-8/mmbtu
LOW COMMERCIAL ATTRACTIVENESS OF U.S. LNG SUPPLIES TO EUROPE

Estimated price range* for U.S. LNG supplies in Europe versus forward prices** in European gas market

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In current environment, forward contract prices at European trading platforms do not cover full cost of future U.S. LNG supplies linked to Henry Hub prices.

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* Based on Henry Hub forward prices, \( P = HH \times 115\% + X \), where \( X \) – costs (liquefaction, shipments, regasification)

** NBP forward prices

*** Historical data: Russian gas prices, including delivery, at German border (according to World Bank), projected data: based on current forward prices of Brent and TTF

Sources: Bloomberg, Cheniere Energy, Wood Mackenzie, World Bank
But there will be a lot of new LNG on the water in the next few years

Source: Rogers/OIES
So not Russian Gas Versus US LNG but Russian Gas Versus LNG

KEY ISSUES FOR NEXT 5 YEARS ARE:

• Demand (price) development – not just in power, but also industrial residential, transport(?) sectors
• Domestic supply decline – especially Netherlands
• Timing/reliability/competitiveness of LNG projects under construction which will impact...
• How long the perceived global LNG surplus will continue
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