European gas balance in the global context

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1. Changing Global Gas Market: Demand
2. Changing Global Gas Market: Supply
3. Gas Pricing in Europe
Growth will be mainly provided by the developing countries

Population growth, GDP, and energy consumption by region

**Population growth in developing countries is followed by an increasing shift in the centre of economic and energy consumption towards these countries.**

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
Centres of energy consumption will notably change their location

The growth of primary energy consumption by region and type of fuel

The consumption of primary energy in the world will increase by 1.1% per year on average between 2010 and 2040, which is significantly slower than the growth in energy consumption seen for the last 30 years, while developed countries will only increase their energy consumption by 3% by 2040.

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
Global gas market development: less demand and more supply

The balance of gas supply and demand in 2040

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
There is no market niche in North America any more.

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
Growing market in Asia

Gas balance in North-East Asia

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
Market niche in Europe: strong competition in the future
Situation on the European gas market does not favor suppliers

- Growing supplies of LNG
- Diversification of pipeline supply sources
- Spot volumes are increasing very fast (30-40% p.a.)
- Majority of the European stakeholders support transition to the spot pricing
- Lower than contracted volumes
- Recovers very slowly
- In the power sector gas is strongly competing with coal
- Unbundling
- Gas Target Model requires all gas to be supplied at the virtual hubs
European gas demand is stagnating during the last decade

Source: Gas Medium-Term Market Report 2012. IEA.
High price of gas doesn`t support gas use in power sector

Source: Bloomberg.
Indirect impact of the US shale gas: redirecting coal to Europe

Source: IEA
Cheap American coal is squeezing gas from the European thermal generation

European monthly power production by type

Source: ENTSO-E
CO2 prices are extremely low and cannot support gas demand

EUA spot prices, Euro/ton CO2 - (EU allowances)

Source: Bloomberg
“Golden age of coal” in Europe: CO2 price has to increase more than 10 times to make gas competitive again
The factors leading to low gas plant utilization are largely irreversible

Source: IEA
Policy-driven decommissioning of old coal plants will enable gas to recover slightly by the end of this decade, but gas plant utilization will remain below the level expected at the time of investment.

*Gas and coal fired power generation in Europe, historical and projected*

Source: IEA
1. Changing Global Gas Market: Demand

2. Changing Global Gas Market: Supply

3. Gas Pricing in Europe
New projects will make Australia LNG producer #1 by 2018

Potential liquefaction capacities additions in Australia

Mln. tonnes

Source: ERI RAS
We don`t know the future US (and Canadian) LNG export volumes

Source: ERI RAS
Global LNG supply is expected to boom during the next decade.

Source: ERI RAS
1. Changing global gas market: demand

2. Changing global gas market: supply

3. Gas pricing in Europe
There is enough gas to expand gas production by 2 tcm by 2040 at the production costs below 4 $/MBtu.

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
In the long-term average weighted regional gas prices are not expected to increase significantly.

Equilibrium gas prices in the three scenarios

Source: Global and Russian Energy Outlook up to 2040. ERI RAS-AC. 2013.
Traditional “Groningen” model is questioned now, as even renegotiated oil-linked contract prices are higher than spot-based.

Source: Bloomberg; ERI RAS.
## Contracts renegotiations

<table>
<thead>
<tr>
<th>Company and Country</th>
<th>Contracted Volumes (bcm)</th>
<th>Contract Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Italy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edison</td>
<td>2,0</td>
<td>The Parties agreed on a discount (70 $/mcm acc. to Morgan Stanley). Total compensation of €200 mln. for FY2011.</td>
</tr>
<tr>
<td>Eni</td>
<td>3,0</td>
<td>15% spot pricing</td>
</tr>
<tr>
<td>ERG</td>
<td>N/A</td>
<td>15% spot pricing</td>
</tr>
<tr>
<td>SinergiItalianiane</td>
<td>N/A</td>
<td>15% spot pricing in 2009. Price discount (lower P0) in 2012.</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.ON</td>
<td>20,0</td>
<td>15% spot pricing. Lawsuit in arbitration.</td>
</tr>
<tr>
<td>RWE</td>
<td>8,0</td>
<td>Lawsuit in arbitration.</td>
</tr>
<tr>
<td>Verbundnetz Gas</td>
<td>6,4</td>
<td>Discount negotiated</td>
</tr>
<tr>
<td>BASF</td>
<td>N/A</td>
<td>In negotiations with Gazprom</td>
</tr>
<tr>
<td>Wingas</td>
<td></td>
<td>Price discount (lower P0) in 2012</td>
</tr>
<tr>
<td><strong>Baltics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estonia</td>
<td>0,4</td>
<td>15% discount granted</td>
</tr>
<tr>
<td>Latvia</td>
<td>0,7</td>
<td>15% discount granted</td>
</tr>
<tr>
<td>Lithuania</td>
<td>2,7</td>
<td>Demands a 15% discount</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGNiG (Poland)</td>
<td>9,0</td>
<td>Demands a 10% discount, lawsuit filed to Stockholm arbitration Court</td>
</tr>
<tr>
<td>Botas (Turkey)</td>
<td>6,0</td>
<td>6,5% discount granted in 2009. 10% discount granted in 2011. Turkey declined to extend the expiring contract.</td>
</tr>
<tr>
<td>GDF Suez (France)</td>
<td>8,0</td>
<td>15% spot pricing in 2009, price discount (lower P0) in 2012</td>
</tr>
<tr>
<td>Econgas (Austria)</td>
<td>5,6</td>
<td>15% spot pricing in 2009. In 2012 price discount (lower P0)</td>
</tr>
<tr>
<td>SPP (Slovakia)</td>
<td>N/A</td>
<td>Price discount (lower P0) in 2012</td>
</tr>
</tbody>
</table>

*Sources: Morgan Stanley. press*
Devil is in the details: new additional gas to Europe - where will it come from?

- Australian gas is going to be most expensive. It is almost completely contracted for the Asian buyers.
- US and Canadian LNG will be primarily targeted at the Asian markets.
- For East Africa Asian markets also seem to be more attractive.
- Norwegian gas?
- Arabian gas?
- Japanese methane hydrates?
Both for the North American and for East African LNG Asia seems to be much more attractive market.

Cost comparison for the US LNG sales to Europe and Asia

Cost comparison for the East African LNG sales to Europe and Asia

Source: ERI RAS
Is there any "plan B"? What if…

» Economic recovery will be faster than expected?
» Energy efficiency targets are not achieved?
» Indigenous production will decline faster than expected (like in the UK)?
» Offshore wind and nuclear plans will fail?
» Under-investment in gas production during the crisis increases?
» There will be rapid demand growth in Asia and Europe will not be able to propose prices competitive with the Asian market in order to attract LNG volumes?
» Domestic demand will be expanding even faster in MENA?
» CCS is not commercial by 2020?
» Alternatives (Southern Corridor, LNG including US, domestic shale gas) will not come in time and at lower price than Russian imports?

*There are potentially numerous gas supply sources to Europe, but by the end of the day only few of them will work. Russian long-term contracts are insurance in case “if something goes wrong” — it will be called upon after some other options have not materialized. It’s better to have your options open, just in case…*
European gas market is going to be tight until 2015-2016 as LNG is diverted to Asia; post 2016 very limited new supplies will become available and there will be an additional call on the over-take-or-pay volumes: good opportunity for Russia to enhance its position

Source: WEO2011, IEA; Cedigaz; ERI RAS.
Gazprom’s strategic choice

We were faced with the choice of whatever was to maintain the supply volumes and the market share, or make the profit our high priority. As a public and commercially oriented company, Gazprom is interested in increasing profits to provide income to shareholders. Therefore, the choice was made, the correct one, in favor of the revenues, and the year results confirmed that.

Alexander Medvedev,
Gazprom Export
Gazprom has a huge portfolio of oil-linked long term contracts for supplies to Europe for the next 25 years and longer

Source: Enerdata, ERI RAS..
Existing long-term contracts guarantee stable sales volumes for Russia until at least 2022

Sources: Cedigaz, Gazprom, ERI RAS.
Arguments: oil indexation vs. gas indexation

**Oil indexation**

- Disappearing gas glut on the European gas market in the medium term – gap between oil-indexed and spot prices will narrow
- Arbitration lasts for several years
- Gazprom will face price reopening and contract expiration only after 2015
- With high oil prices even lower sales volumes are providing high revenue
- New projects need high prices
- Oil indexation is needed for the project financing

**Spot indexation**

- Strong pressure from the customer side
- Gazprom could demand financial compensation for contract review + 3rd Package exemption for the South Stream and NEL + transitional period for price adjustments + European-level financial support for its mega-projects (like EBRD and other European financial institutions)
- Gazprom could become a dominant player dictating prices at the spot market by changing its supply volumes

There are strong commercial reasons for Gazprom to protect the oil indexation at least during the next 3-5 years
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