Ukraine’s Gas Market Reform: Green Light to Investments in Natural Gas Transmission, Production and Energy Efficiency

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www.naftogaz-europe.com
www.naftogaz.com
Naftogaz is a vertically integrated group covering the entire supply chain.

Key activities of Naftogaz Group:

**Upstream, gas processing**
- 15 bcm produced in '14
- Over 230 oil, gas, gas and oil condensate fields
- 39 gas processing plants

**Gas transportation & storage**
- 153 bcm transit capacity
- 39 K km gas pipelines network
- 31 bcm of underground gas storage
- 62 bcm transit in 2014
- 38 bcm supplied domestically in 2014

**Wholesale gas distribution & trading**
- 2012 –’14 major importer
- Until 2012 monopoly gas importer

Naftogaz is a major wholesaler and main supplier of gas to households, district heating companies.

Naftogaz gas business constitutes 90% of the Company’s earnings.
2014-15: Gas Market liberalization initiated

Key milestones already reached:

- **Gas Market Law** adopted compliant with EU Energy Law
- **Price Reform** initiated to gradually liberalize gas prices for households
- **Corporate Governance Reform** launched to conform to OECD standards
- **EU-UA Gas Network Integration** increased to diversify supply sources
Naftogaz effectively diversified gas imports

Sources of imported gas supplies to Ukraine

<table>
<thead>
<tr>
<th>Year</th>
<th>Russia, single supplier</th>
<th>Europe, multiple suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>92%</td>
<td>8%</td>
</tr>
<tr>
<td>2014</td>
<td>74%</td>
<td>26%</td>
</tr>
<tr>
<td>1Q 2015</td>
<td>61%</td>
<td>39%</td>
</tr>
</tbody>
</table>
2015 and on: Ambitious Perseverance

Competitive and efficient gas market will develop as we:

- **Attract** new players via joint ventures in transmission and storage operations, and potential partial privatization of upstream or storage assets
- **Increase** upstream production
- **Develop** new infrastructure to enhance interconnectivity with the EU
- **Improve** energy efficiency
- **Unbundle** transmission business segment by mid 2016
Key priorities going forward: Full Ownership Unbundling

Ownership unbundling of the transmission system operator (TSO) in compliance with 3rd energy package (EU)

EU and US companies to be invited as JV partners in gas transmission and gas storage businesses

The state will remain the owner of the gas transmission system and underground gas storages

On-going transparency and efficiency improvement through stronger corporate governance in compliance with OECD principles

Independent decision-making by the JVs
Potential benefits for JV Partner in natural gas transmission operations

**Strategic advantages:**

- Most powerful transit infrastructure in the world with capacity of exit - 158 bcm/Y, entry – 248 bcm/Y
- Supplies to 18 European countries
- Crucial role in the European transit system, accounting for up to 15% of total gas import to EU
- Direct interconnections with EU (PL, SK, HU, RO) and with RU, MD, BY
- Revenues ensured by regulated RAB-based tariffs
- Substantial potential of transit volumes increase without significant investment
- Sole transmission system operator

**Natural gas transit via Ukraine, bcm**

<table>
<thead>
<tr>
<th>Year</th>
<th>Transit volumes</th>
<th>Excess Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>59</td>
<td>99</td>
</tr>
<tr>
<td>2011</td>
<td>54</td>
<td>104</td>
</tr>
<tr>
<td>2012</td>
<td>74</td>
<td>84</td>
</tr>
<tr>
<td>2013</td>
<td>72</td>
<td>86</td>
</tr>
<tr>
<td>2014</td>
<td>96</td>
<td>62</td>
</tr>
</tbody>
</table>

**Natural gas domestic supplies, bcm**

- CAGR: -6%

- Industry
- Production and tech. costs
- Households, District Heating, Government financed institutions
Potential benefits for JV Partner in gas storage operations

Strategic advantages:

- Largest storage capacity in Europe - 31 bcm (1/3 of EU28)
- Storage capacity of over 25 bcm on border with the EU
- Essential infrastructure for EU gas stock (both security and commercial) and creation of a gas hub
- Strategic geographical location of storages allows gas supply from one point on the Ukraine-EU border to 6 countries
- A valuable complex of assets with potential privatization of some storages

Natural gas storage volumes, bcm

- Available storage capacity
- Capacities load (end of injection period)

Huge potential for further development
Key to energy independence: energy efficiency, production growth

Ukrainian gas import requirement

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020F</th>
</tr>
</thead>
<tbody>
<tr>
<td>~20 bcm</td>
<td>13-17 bcm</td>
<td>3-7 bcm</td>
</tr>
</tbody>
</table>

How will this be achieved?

- **6-8 bcm** Energy efficiency
  - Required investment*: US$10-15 bn

- **7-9 bcm** Domestic production growth
  - Required investment*: US$5-6 bn

*Preliminary estimates
## Opportunity: Energy Efficiency

### Energy efficiency measures can save ~6 bcm/y by 2020 and ~12 bcm/y by 2025

<table>
<thead>
<tr>
<th>Where</th>
<th>What</th>
<th>Gas savings, bcm/y</th>
<th>Investment, US$bn</th>
<th>Investment efficiency, cm/US$</th>
<th>Project scope and time to capture the effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>House</strong></td>
<td>Alternative fuel boilers</td>
<td>~3.0</td>
<td>3.7</td>
<td>0.8</td>
<td>~7mn HH, 3-5 years</td>
</tr>
<tr>
<td></td>
<td>More efficient gas boilers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alternative fuel boilers</td>
<td>1.1</td>
<td>~2.0</td>
<td>0.6</td>
<td>~20 ths boilers, 3-5 years</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Building</strong></td>
<td>Pipes replacement and insulation</td>
<td>~0.7</td>
<td>~1.7</td>
<td>0.4</td>
<td>~250 DHC, 3-5 years</td>
</tr>
<tr>
<td><strong>Building</strong></td>
<td>Heat meters with</td>
<td>~0.8</td>
<td>~2.4</td>
<td>0.3</td>
<td>~100 ths buildings, 1-2 years</td>
</tr>
<tr>
<td></td>
<td>temperature regulators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermo modernization</td>
<td>5.5</td>
<td>~10.3</td>
<td>0.5</td>
<td>~7 mn HH, 10 years</td>
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<td></td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>~12 bcm/y</td>
<td>~US$36bn</td>
<td></td>
<td></td>
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Impact is calculated for each measure separately. Total gas savings in case of implementation of all measures.
Opportunity: Upstream Development

Ambitious plans present opportunities for international gas production companies and companies offering equipment, services and know-how

- Conventional resources potential 39Tcf = 1.1Tcm \(^1\)
- Reserves-to-production ratio 34,3 – the largest in continental Europe \(^2\)

With sufficient investment production could increase by 7-9 bcm by 2020 and more than double by 2030:
- Future production depends on application of modern technologies for seismic evaluation, drilling, completion, well stimulation, and production management.

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\(^1\) Source: US Energy Information Administration
Other urgent investment opportunities
## Other urgent investment opportunities

**Poland-Ukraine 110 km gas interconnector with capacity of 8 bcm/y will allow to:**

- Increase current gas import capacity from EU **by 53%**
- Satisfy c. **40% of Ukraine’s total requirement** for natural gas imports
- Provide access for EU traders to UA gas storages with **capacity of 31 bcm**
- Contribute to development of the **pan-European “North-South Gas Corridor”**

**Complete overhaul of drilling rigs and equipment will allow to:**

- **Expand** exploration and production drilling capacity to **300-350 ths. m/Y by 2020**
- **Expand drilling equipment range** to meet current complex drilling tasks
- Increase the average **drilling depth over 6 ths.m**
- Wider use **high pressure equipment and hydraulic fracturing techniques**

**Modernization of Shebelinka Refinery to achieve Euro-5 quality standard will allow to:**

- Potentially increase **market share of the Company up to 15%**
- Significantly **improve operational results** after modernization
- Ensure **immediate pricing premium** for sales through own filling stations chain
- **Decrease dependency from imported fuels**

<table>
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<th>Estimated project cost –</th>
<th>245 mln EURO</th>
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<th>356 mln USD</th>
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