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**Prospects of shale gas in Eastern Europe. Evidence from recent field research**

ETIP/Consortium Energy Policy Seminar Series
Oct 20 2014
Europe – a new frontier in shale gas?

Source: International Energy Agency
### How much is there?

<table>
<thead>
<tr>
<th>Region totals and selected countries</th>
<th>2011 natural gas production (Tcf)</th>
<th>January 1, 2013 estimated proved natural gas reserves (Tcf)</th>
<th>2013 EIA/ARI unproved wet shale gas technically recoverable resources (TRR)</th>
<th>2012 USGS conventional unproved wet natural gas TRR, including reserve growth (Tcf)</th>
<th>2012 USGS technically recoverable gas resources (Tcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>10</td>
<td>145</td>
<td>470</td>
<td>184</td>
<td>799</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td></td>
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<td>Denmark</td>
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<td>2</td>
<td>32</td>
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</tr>
<tr>
<td>France</td>
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<td>0</td>
<td>137</td>
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<td>Germany</td>
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<td>1</td>
<td>17</td>
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<tr>
<td>Netherlands</td>
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<td>43</td>
<td>26</td>
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<td></td>
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<tr>
<td>Norway</td>
<td>4</td>
<td>73</td>
<td>0</td>
<td></td>
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<tr>
<td>Poland</td>
<td>0</td>
<td>3</td>
<td>148</td>
<td></td>
<td></td>
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<tr>
<td>Romania</td>
<td>0</td>
<td>4</td>
<td>51</td>
<td></td>
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<tr>
<td>Spain</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td></td>
<td></td>
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<tr>
<td>Sweden</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
<td>9</td>
<td>26</td>
<td></td>
<td></td>
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<tr>
<td>Former Soviet Union</td>
<td>30</td>
<td>2,178</td>
<td>415</td>
<td>2,145</td>
<td>4,738</td>
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<tr>
<td>North America</td>
<td>32</td>
<td>403</td>
<td>1,685</td>
<td>2,223</td>
<td>4,312</td>
</tr>
</tbody>
</table>

Source: EIA 2013
What difference could shale gas make in Europe?

Sources: CERA, BP
What difference could shale gas make in Europe?

### Russian import shares, select CEE countries, 2012

<table>
<thead>
<tr>
<th>Gas</th>
<th>Market size (bcm)</th>
<th>Net imports from RF (bcm)</th>
<th>RF imports as % of consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuania</td>
<td>3.4</td>
<td>3.4</td>
<td>100%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>2.7</td>
<td>2.4</td>
<td>88%</td>
</tr>
<tr>
<td>Hungary</td>
<td>9.7</td>
<td>7.6</td>
<td>78.2%</td>
</tr>
<tr>
<td>Poland</td>
<td>16.6</td>
<td>9.7</td>
<td>58.6%</td>
</tr>
<tr>
<td>Romania</td>
<td>13.5</td>
<td>3.2</td>
<td>24.3%</td>
</tr>
<tr>
<td>Germany</td>
<td>75.2</td>
<td>27</td>
<td>37%</td>
</tr>
</tbody>
</table>

Sources: BP 2013, Eurogas
What difference could shale gas make in Europe?

### Estimated Size of Shale Gas and Shale Oil Resources in CEE

<table>
<thead>
<tr>
<th>Continent</th>
<th>Region</th>
<th>Basin</th>
<th>Risked Gas In-Place (Tcf)</th>
<th>Technically Recoverable (Tcf)</th>
<th>Risked Oil In-Place (Billion bbl)</th>
<th>Technically Recoverable (Billion bbl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Europe</td>
<td>Poland</td>
<td>Baltic Basin/Warsaw Trough</td>
<td>532</td>
<td>105</td>
<td>25</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lublin</td>
<td>46</td>
<td>9</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Podlasie</td>
<td>54</td>
<td>10</td>
<td>12</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fore Sudetic</td>
<td>107</td>
<td>21</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Lithuania/Kaliningrad</td>
<td>Baltic Basin</td>
<td>24</td>
<td>2</td>
<td>29</td>
<td>1.4</td>
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<tr>
<td></td>
<td>Russia</td>
<td>West Siberian Central</td>
<td>1,196</td>
<td>141</td>
<td>965</td>
<td>57.9</td>
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<tr>
<td></td>
<td></td>
<td>West Siberian North</td>
<td>725</td>
<td>141</td>
<td>278</td>
<td>16.7</td>
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<tr>
<td></td>
<td>Ukraine</td>
<td>Carpathian Foreland Basin</td>
<td>362</td>
<td>72</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td></td>
<td></td>
<td>Dniepr-Donets</td>
<td>312</td>
<td>76</td>
<td>23</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Romania/Bulgaria</td>
<td>Moesian Platform</td>
<td>48</td>
<td>10</td>
<td>2</td>
<td>0.1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>148</td>
<td>37</td>
<td>8</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Source: EIA 2013

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Can the U.S. success story be replicated in Europe?

**Environment**
- Environmental standards (no ‘Halliburton loophole’)
- Access to water and disposal of waste water
- Environmental movements

**Regulation**
- Ownership of subsoil resources (state not private)
- Land access/drilling rights
- Population density
- Fiscal regimes for unconventional gas production

**Economics**
- Availability of (pipeline) infrastructure
- Depth of energy service sector
- High well costs: $8–$12 Mbtu (US: $3–$7/Mbtu)

No ‘copy – paste’ job

Goldthau Oct 20 2014
European rig counts are small by international comparison

Rig counts, oil and gas, Sept 2014

- Latin America: 1,845
- U.S.: 371
- Middle East: 409
- Asia Pacific: 254
- Canada: 134
- Europe: 144
- Africa: 403

Source: Baker Hughes
Two CEE shale gas tales: Bulgaria vs. Poland and the social license to extract

- Common supranational regulatory environment (EU)
- Common regulatory past (communism)
- Common dependency on Russia
- History in extractive industry
- Similar exposure to Unconventional Gas Technical Engagement Program
Bulgaria’s top-down process ignores incumbents and stakeholders

- Top-down and non-participatory approach, regulatory arbitrariness

"Shale gas got promoted out of nowhere by the former energy minister."

"I have never been asked to look into this matter or to participate in any way."

"It is a political decision to proceed with it or not and so much a question of environmental policy or local concerns."

"We only got a letter from the ministry when Chevron was granted a permit for exploration that we need to assist the company first to move their heavy vehicles for the seismic studies and then to provide it with land for the drills."

Mayor of Toshevo municipality
Bulgaria fails to create appropriate institutional framework

- Silo type policy process
- Lack of information
- Distrust in process and actors

“Authorities do not show effective coordination because they resort mostly to control functions.”

“It looked like the government had an agreement with Chevron without assessment of the risks and this made many reasonable people in Bulgaria angry.”

“We needed to get informed and we were studying Internet sources for a month such as Gasland. The signals were worrying.”

“Ministers and their advisors do not communicate and do not take the advice from scientists, that’s not part of political process.”

“The government was surprised by the intensity [of protests] and [the protesters] ability to engage not only NGOs but also professional business circles.”

Former ambassador of Bulgaria in Russia

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Bulgaria fails to create pro-shale policy narrative

- Opens floor for environmental narrative against shale
- Opponents create issue linkage with aquifer
- Protests erupt across the country

"Foreign companies [...] do not create jobs for the local population. [...] Only guards, cleaning ladies and drivers, [...] other jobs are for foreign experts."

Green MP

"Nobody is talking about the economic benefits which those people would have, like: working places, new infrastructure, direct financial revenues in the municipal budget from concession fees and from the profits"

Scientist, Institute of Geology, Bulgarian Academy

“We don’t have any gains”

Mayor of Toshevo municipality

May 2011: Chevron wins exploration permit.

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Poland’s comprehensive institutional framework facilitates buy-in of stakeholders

- Comprehensive process
- Information & scientific flanking
- Trust in process and actors
- Economic incentives

“We are in touch with companies [and] PGNiG. The main thing is to bring investors here and extract gas.”

Senior Officer, Department of Strategic Projects, Office of Minister of Treasury

“It is not the case that the government pushes us into this. There is a huge potential for innovation in this sector. It creates experts. [...] We can benefit from foreign direct investment.”

Chief Economist, PKN Orlen

“We believe the most important factor is to provide the information to people so they can make decisions based on information that is at least from two sources if not more, not just one. [We then encourage companies to] clarify the situation, so it encourages people to participate.”

Deputy Director, Regional Directorate for Environmental Protection

“The investor has to provide an information chart to the local municipality and this authority is to issue an decision, but before they send the chart here. [We then encourage companies to] clarify the situation, so it encourages people to participate.”

Advisor to Minister of the Environment

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Poland’s national shale gas discourse is about security and jobs jobs jobs

- Shale gas as national project

- Shale gas as opportunity

“A second Norway”

“Gas security is a fundamental prerequisite of sovereignty.”

“It would be a good source of energy, it would support renewables, can be important drivers for the Polish economy, can produce cheaper gas for chemical industries.”

“[s]hale gas is not a priority for our organization, we look at the whole energy mix. Our opinion is not absolutely negative - with appropriate regulations shale gas could be better than coal.”

“This is good for the country and makes us independent. Finally. And it is good for my business.”

Local hotel owner, Lublin

Polish Parliament passes shale gas law on 11 June 2014

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Lessons learned from CEE shale gas tale

- Stakeholder process matters
  - Poland: multilevel and multi-player
  - Bulgaria: top-down and single player
  - Institutional trust
  - Institutional adaptability

- Discourse matters
  - Environment/ security/ economy
  - Fit with existing national project discourse (yes/no)

- Social license to extract encompasses all policy levels
Take-aways for prospects of shale gas in CEE

- Geology aside....

- **Getting process right** for creating social license to extract matters as much as technology transfer/import itself

- **Comprehensive shale gas policy regimes** imperative for facilitating adaptation of incumbent regulatory frameworks and inclusion of key stakeholders

  → Absent either of which, shale gas industry will fail

  → CEE shale gas industry will likely see **slow growth** only but comprehensive process is the only way forward