Prospects for the Establishment of Regional Gas Trading Hubs

Joint ROEC/IENE Event in Bucharest
EC Representation in Bucharest
October 16, 2019

A Presentation by Mr. Dimitris Mezartasoglou
Head of Research, IENE
European Gas Hubs and Exchanges

Source: Interfax Global Energy
Hub Pricing is Expanding in Europe

Figure 6.3 Europe Price Formation 2018

- RSP: 0%
- OPE: 24%
- GOG: 76%

Figure 1.2 Europe Price Formation 2005 to 2018

Source: IGU Wholesale Gas Price Survey 2019
Hub Pricing is also Expanding in SE Europe

Figure 6.8 Southeast Europe Price Formation 2005 to 2018

GOG: gas-on-gas competition
OPE: oil price escalation

Southeast Europe, as defined by IGU, includes Bosnia, Bulgaria, Croatia, North Macedonia, Romania, Serbia and Slovenia

Source: IGU Wholesale Gas Price Survey 2019
Where Does SE Europe Stand Today?

**Established hubs**
- Broad liquidity
- Sizeable forward markets which contribute to supply hedging
- Price reference for other EU hubs and for long-term contracts indexation

**Advanced hubs**
- High liquidity
- More reliant comparatively on spot products
- Progress on supply hedging role but relatively lower liquidity levels of longer-term products

**Emerging hubs**
- Improving liquidity from a lower base taking advantage of enhanced interconnectivity and regulatory interventions
- High reliance on long-term contracts and bilateral deals

**Iiquid-incipient hubs**
- Embryonic liquidity at a low level and mainly focused on spot
- Core reliance on long-term contracts and bilateral deals
- Diverse group with some jurisdictions having -organised markets in early stage -to develop entry-exit systems

Source: ACER Market Monitoring Report 2018
What is a Successful Gas Trading Hub?

- **Goal**
  - Competitiveness
  - Security of supply

- **Instrument**
  - Transparent and reliable price signals
  - Liquidity

- **Parameter**
  - Customers
  - Trade volumes
  - Churn rate
  - Standardised products, etc.

Source: CEGH
European Gas Network: SEE EU Needs Additional Import Routes

Source: DEPA
The Expanded Southern Gas Corridor

NB.: The TANAP has been completed, while TAP, Turkish Stream and IGB are under construction. The IAP, the IGI Poseidon in connection with East Med pipeline and the Vertical Corridor and the IGF are still in the study phase. Blue Stream and Trans Balkan are existing pipelines.

Source: IENE
## Major Gas Pipeline Projects Under Construction in SE Europe

<table>
<thead>
<tr>
<th>Project</th>
<th>Shareholders</th>
<th>Length</th>
<th>Cost</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TAP</strong></td>
<td>BP (20%), SOCAR (20%), Snam S.p.A (20%), Fluxys (19%), Enagás (16%) and Axpo (5%)</td>
<td>878 km</td>
<td>€4.5 billion</td>
<td>10.0-20.0 bcm/y</td>
</tr>
<tr>
<td><strong>IGB</strong></td>
<td>BEH (50%), IGI Poseidon (50%)</td>
<td>182 km</td>
<td>€220 million</td>
<td>3.0-5.0 bcm/y</td>
</tr>
<tr>
<td><strong>Turkish Stream</strong></td>
<td>Gazprom, BOTAS</td>
<td>1,100 km</td>
<td>€11.4 billion</td>
<td>31.5 bcm/y*</td>
</tr>
<tr>
<td><strong>Bulgaria-Romania-Hungary-Austria (BRUA)</strong></td>
<td>Bulgartransgaz, Transgaz, FGSZ, Eustream, GCA</td>
<td>500 km</td>
<td>€500 million</td>
<td>6 bcm/y</td>
</tr>
</tbody>
</table>

*This amount corresponds to the first two strings of the pipeline with an additional 31.5 bcm foreseen when strings 3 and 4 will be constructed and become operational.*

Source: IENE and involved energy companies
### Overview of Underground Gas Storage Facilities in SE Europe (2018)

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of UGS Facilities</th>
<th>Working gas capacity (bcm)</th>
<th>Max. withdrawal rate (mcm/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1</td>
<td>0.6</td>
<td>4</td>
</tr>
<tr>
<td>Croatia</td>
<td>1</td>
<td>0.6</td>
<td>7</td>
</tr>
<tr>
<td>Romania</td>
<td>8</td>
<td>3.1</td>
<td>32</td>
</tr>
<tr>
<td>Serbia</td>
<td>1</td>
<td>0.5</td>
<td>5</td>
</tr>
<tr>
<td>Turkey</td>
<td>2</td>
<td>3.4</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>8.2</strong></td>
<td><strong>93</strong></td>
</tr>
<tr>
<td>Under Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serbia</td>
<td>1</td>
<td>0.3</td>
<td>5</td>
</tr>
<tr>
<td>Turkey</td>
<td>3</td>
<td>6.5</td>
<td>110</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
<td><strong>6.8</strong></td>
<td><strong>115</strong></td>
</tr>
<tr>
<td>Planned</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1</td>
<td>0.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Croatia</td>
<td>1</td>
<td>-</td>
<td>2.4</td>
</tr>
<tr>
<td>Greece</td>
<td>1</td>
<td>0.4</td>
<td>4.0</td>
</tr>
<tr>
<td>Romania</td>
<td>4</td>
<td>1.2</td>
<td>9.3</td>
</tr>
<tr>
<td>Turkey</td>
<td>3</td>
<td>5.5</td>
<td>57.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>7.6</strong></td>
<td><strong>77.9</strong></td>
</tr>
<tr>
<td>Potential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albania</td>
<td>2</td>
<td>1.3</td>
<td>6.5</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>1</td>
<td>0.1</td>
<td>1.9</td>
</tr>
<tr>
<td>Turkey</td>
<td>1</td>
<td>1.0</td>
<td>16.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
<td><strong>2.4</strong></td>
<td><strong>24.5</strong></td>
</tr>
</tbody>
</table>

Source: CEDIGAZ
LNG Terminals in SE Europe

Source: IENE
Poseidon Med II LNG Bunkering Project

Source: DEPA
Anticipated Gas Volumes Through Greece (2021-2030)

- Through TAP  $\rightarrow$ **10.0 bcm (2021)** (i.e. 1.0 bcm to Greece, 1.0 bcm to Bulgaria and 8.0 bcm to Italy), while **20.0 bcm (2030)** (i.e. 2.5 bcm to Greece, 1.5 bcm to Bulgaria and 16.0 to Italy)
- Through IGB  $\rightarrow$ **1.0 bcm (2021)** and **4.0 bcm (2030)**
- Through IGNM  $\rightarrow$ **1.0 bcm (2023)** and **1.5 bcm (2030)**
- Through the Revithousa LNG Terminal  $\rightarrow$ **1.5 bcm (2020)** growing to **3.0 bcm (2030)**
- Through Alexandroupolis FSRU  $\rightarrow$ **1.0 bcm (2022)** growing to **4.0 bcm (2030)**
- Through East Med  $\rightarrow$ **0.0 bcm (2020)** with the prospect of **10.0 bcm (2030)**

Based on the above, it is estimated that in the first phase (2021), **12.0-13.0 bcm** of additional gas volumes will be directed through Greece to various destinations, corresponding to 2.6% of European gas demand (excluding Turkey), while in 2030 these quantities may have reached **30.0 bcm**, which will correspond to approx. 6.4% of European gas demand.
### Gas Production and Consumption (bcm) in SE Europe (2008, 2018 and 2025)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>0.02</td>
<td>0.02</td>
<td>0.1</td>
<td>0.09</td>
<td>0.01</td>
<td>0.22</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>0.0</td>
<td>0.31</td>
<td>0.0</td>
<td>0.24</td>
<td>0.0</td>
<td>0.45</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.31</td>
<td>3.5</td>
<td>0.01</td>
<td>3.04</td>
<td>0.21</td>
<td>4.3</td>
</tr>
<tr>
<td>Croatia</td>
<td>2.03</td>
<td>3.1</td>
<td>1.28</td>
<td>2.84</td>
<td>1.52</td>
<td>3.3</td>
</tr>
<tr>
<td>Cyprus</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>North Macedonia</td>
<td>0.0</td>
<td>0.05</td>
<td>0.0</td>
<td>0.18</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Greece</td>
<td>0.0</td>
<td>4.25</td>
<td>0.1</td>
<td>4.87</td>
<td>0.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Kosovo</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Montenegro</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Romania</td>
<td>11.2</td>
<td>16.9</td>
<td>10.26</td>
<td>11.97</td>
<td>10.02</td>
<td>14.1</td>
</tr>
<tr>
<td>Serbia</td>
<td>0.25</td>
<td>1.92</td>
<td>0.45</td>
<td>2.93</td>
<td>0.51</td>
<td>2.8</td>
</tr>
<tr>
<td>Slovenia</td>
<td>0.0</td>
<td>0.51</td>
<td>0.0</td>
<td>0.8</td>
<td>0.0</td>
<td>1.07</td>
</tr>
<tr>
<td>Turkey</td>
<td>1.03</td>
<td>36.9</td>
<td>0.51</td>
<td>49.64</td>
<td>0.73</td>
<td>56.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14.84</strong></td>
<td><strong>67.46</strong></td>
<td><strong>12.71</strong></td>
<td><strong>76.60</strong></td>
<td><strong>13.00</strong></td>
<td><strong>88.84</strong></td>
</tr>
</tbody>
</table>

Sources: European Commission, IENE
Russia’s Gas Supplies to Selected SEE Countries (bcm), 2018

Source: Gazprom Export
Annual Scorecard 2018 Update

EFET 2018 Gas Hub Benchmarking Study

Source: EFET
Total Hub Scores 2018

Source: EFET
European Gas Trading Hubs in 2018

**NBP**  
National Balancing Point; Great Britain; 1996

**ZEE/ZTP**  
Zeebrugge Hub / Zeebrugge Trading Point; Belgium; 2000/2012

**TTF**  
Title Transfer Facility; Netherlands; 2003

**PSV**  
Punto di Scambio Virtuale; Italy; 2003

**PEG (N,S,T) / TRS / TRF**  
Points d’Echange de Gaz (Nord, Ouest, Est, Sud, TIGF); France: 2004  
PEG Nord (merger of PEGs N, O, E); France: 2009  
Trading Region South (covering PEG Sud and TIGF); France: 2015  
Trading Region France (covering PEG Nord, Sud and TIGF); France: 2018

**AOC / PVB**  
Almacenamiento Operativo Comercial / Punto Virtual de Balance; Spain; 2004/2015

**GTF / ETF**  
GasTransfer Facility / Electronic Transfer Facility; Denmark; 2004

**CEGH / VTP**  
Central European Gas Hub / Virtual Trading Point; Austria; 2005/2013

**GPL**  
Gaspool; Germany; 2009

**NCG**  
NetConnect Germany; Germany; 2009

**MGP**  
Magyar Gázkiegynlitési Ponton; Hungary; 2010

**VOB**  
Virtuální Obchodní Bod; Czech Republic; 2011

**VPGS**  
Virtual Point Gaz-System; Poland; 2014

**SK (VOB)**  
Slovenskom Virtuálnom Obchodnom Bode; SK; 2016

Proposed Road Map for the Development of a Natural Gas Hub Based in Greece

**Since 2013**
- OTC trades for shippers only

**Since 1.7.2018**
- OTC trades for both shippers and traders
- trades with TSO for balancing gas at a Balancing Platform

**By end-2019**
- OTC trades for both shippers and traders
- trades with TSO for balancing gas at a Trading Platform
- anonymous exchange spot trades

**Further on**
- OTC trades for both shippers and traders
- trades with TSO for balancing gas at a Trading Platform
- anonymous exchange spot trades
- futures, derivatives

**Virtual Nomination Point**
- Who: DESFA
- Status: Completed since 2013

**Virtual Trading Point and Balancing Platform**
- Who: DESFA
- Status: Completed since July 1st 2018

**Virtual Trading Point and Trading Platform**
- Who: DESFA + Energy Exchange
- Status: In progress

**Virtual Trading Point and Trading Platform**
- Who: DESFA + Energy Exchange
- Status: To be developed

Source: DESFA
The Balkan Gas Hub, as Envisaged by Bulgaria

The Balkan Gas Hub is located at cross-road of Southeast Europe's current and future pipeline systems.

Wide range of alternative sources: Russia, Caspian Sea, Romania, Bulgaria, LNG Greece, LNG Turkey, East Med, Middle East.

Source: Schneider, M. (2018)
The Gas Hub of Romania

Source: OIES Energy Insight
Integration of Turkey with European Hubs

- 8 major European trading hubs
- Trading on OTC’s via brokers
- Trading on Energy Exchanges

After Turkey completes structural reforms, its gas market will be integrated with EU trading hubs and establish a regional gas reference price

Source: PETFORM
The Creation of a Natural Gas Hub Based in Turkey

- After the successful completion of a five-month testing phase, starting on April 1, 2018, the spot gas trading system in Turkey officially went online.

- On July 27, 2018, EPİAŞ began to publish gas transmission data through its online transparency platform. It also started to share transport nomination, virtual trade, capacity, reserve, actualization and stock amounts, on a daily basis.

- EPİAŞ launched its spot gas trading system on the energy stock exchange in early September 2018.

Source: EPİAŞ
Emerging Gas Trading Hubs in SE Europe

- Each country in SE Europe is planning to become a regional gas trading hub. Based on the aforementioned EFET Annual Scorecard 2018, Greece, Turkey, Bulgaria and Romania are set in a course of developing gas trading activity.

- Some of the above countries will be able to launch fully-fledged gas trading hubs by 2021-2022.

- In SE Europe, there are also other countries that have already expressed interest for the establishment of a gas trading hub (e.g. Croatia and Slovenia).

- It is not yet clear which of the above countries will come to play a dominant role in the region so as to be soon recognized as a regional gas hub. Greece and Turkey appear to be frontrunners at this stage.
New IENE Study on Gas Trading Hubs in SE Europe

- The changing landscape in the SE European gas markets
- Overview of the existing and emerging gas trading hubs in the European and SE European region
- The role of Central European Gas Hub (CEGH) as a benchmark and pivot for promoting gas trading in SE Europe
Thank you for your attention

www.ienie.eu
dimmeza@iene.gr