GAS MARKET INTEGRATION AND DECARBONIZATION

THE CASES OF SOUTHEAST AND CENTRAL AND EASTERN EUROPE

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INTRODUCTION

- **Internal EU gas market goals:**
  - Multiple entry-exit zones & reverse flows;
  - Hub & LNG trading in less liberalized zones;
  - Enhanced solidarity & regional coordination.

- Diffusion of gas market acquis to membership aspirants & partner countries.

- Decarbonization challenges (2030-2050): security + competitiveness + sustainability.

- **Virtuous circle:**
  - Low- /De-carbonization
  - Affordability
  - Supply security

Observers (Minus Georgia)
Assessment of conventional gas market integration in SEE & CEE, along with analysis of challenges in view of the low-/de-carbonization of the EU gas sector.
SECTION 1 – THE MARKETS

SCOPE OF THE SECTION

Analysis of market features in SEE & CEE
– Problems & EU policy goals.
SECTION 1

THE PROBLEMS

- Historical overreliance on Russian gas, except for Romania.
- Lack of infrastructure connections to diverse gas supply sources.
- Lack of interconnectivity between markets within respective regions and with Western Europe.
- Mostly unidirectional gas lines (East-West: CEE & North-South: SEE).
- Limited access to LNG supplies.

Exceptions → 🇹🇷 🇬🇷 🇬🇧 🇧Isl 👉 🇶 ^= 🇹来て

EU POLICY GOALS

- Ensure both regions’ access to at least three different gas sources (CESEC).
- Enhance their transit role via diverse (Caspian, Middle East, US, Norway) & bi-directional gas flows.
- Interlink them via prospective pipeline and LNG projects, including certain of those into its PCI lists.
- Export to them the NWE market pattern, based on gas-to-gas competition.
- Create commercial natural gas sectors from zero:
SECTION 2 – THE SOFTWARE

SCOPE OF THE SECTION

Assessment of the implementation of the EU gas market acquis in CEE & SEE – Policy highlights.
SECTION 2

HUB LIQUIDITY

- Negligible or zero momentum towards hub trading activity in both regions.

- Balkan Gas Hub: First auctions under Gas Release Program & multilateral trading, incl. s-t (spot), l-t segments & brokering service. Clearing services to follow.

- MGP: Emerging hub, according to ACER, thanks to price-competitive transportation tariffs & timely implementation of Balancing NC.

- Ukraine: Hub efforts helped by gas production & consumption, interconnections to other EU hubs and capitalization on vast gas storage capacity.

SECTION 2

UNBUNDLING

- **Ukraine (EnCo CP):** UA GTSO certified under the ISO model.

- **Turkey (EnCo observer):** Limited progress with unbundling of BOTAS’s transport & wholesale businesses.

- **Bulgaria (EU M-S):** EC’s EUR77M fine on BEH. Bulgargaz & Bulgartransgaz (BEH subsidiaries) in charge of gas supply & national gas infrastructure + sole storage facility, respectively.

NETWORK CODES


- **Transposition & implementation dates** since then set for the remainder of Network Codes.
SECTION 2

REMIT

- Promotion of integrity and transparency in both electricity and gas trading through detection & deterrence of market abusive practices.
- Now implemented by Bosnia and Herzegovina in the field of electricity.
- Pertinent decision under development by Kosovo’s Energy Regulatory Office.

LNG MARKET POTENTIAL

- EaP policy highlights include establishment of the Azerbaijan Energy Regulatory Agency in late ‘17.

BUT: Special focus placed on LNG market potential, an initiative led by Poland & Ukraine since 2018, with a pertinent study launched in early 2020.
# Section 2

## Annex – EU Gas Market Acquis in the Energy Community CPs (Source: ECS)

### Unbundling

<table>
<thead>
<tr>
<th>Country</th>
<th>EU Gas Market Acquis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP AG (ITO)</td>
<td>Albgaz (OU)</td>
</tr>
<tr>
<td>GTSO (ISO)</td>
<td></td>
</tr>
<tr>
<td>GAS PROMET (ongoing)</td>
<td></td>
</tr>
<tr>
<td>MTG (ongoing)</td>
<td></td>
</tr>
<tr>
<td>GA-MA (pending – OU law)</td>
<td></td>
</tr>
<tr>
<td>GGC (pending – OU/ISO law)</td>
<td></td>
</tr>
<tr>
<td>No TSO yet (OU law)</td>
<td></td>
</tr>
<tr>
<td>No TSO yet (OU law)</td>
<td></td>
</tr>
<tr>
<td>Gastrans (ITO – despite ECS Opinion)</td>
<td></td>
</tr>
<tr>
<td>Srbijagas (pending)</td>
<td></td>
</tr>
<tr>
<td>Yugorosgaz Transport (ISO – withdrawn)</td>
<td></td>
</tr>
</tbody>
</table>

### Network Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Implementation Deadline</th>
</tr>
</thead>
</table>

### REMIT

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</tr>
</thead>
</table>

**Expected by late 2020:**

**Change of national legislation required:**
SECTION 3 – THE HARDWARE

SCOPE OF THE SECTION

Assessment of market liberalization in CEE & SEE based on physical gas supply corridors & interconnections - *Infrastructure highlights.*
SECTION 3

BEYOND THE SOUTHERN GAS CORRIDOR

- **SGC as la raison d’être** for pipelines & LNG terminals enhancing cross-border interconnectivity in the Balkans and further northward.

- **TAP vs Nabucco West**: Western Balkan gas market & supply diversification along the Greece-Hungary/Ukraine vertical axis, via swaps & reverse flows north of TAP.

- **Vertical Gas Corridor**: System of reverse-flow interconnectors (Hungary-Greece via Bulgaria & Romania), providing non-Russian supplies via TAP & the Alexandroupoli FSRU.

- North Macedonia (Kyustendil-Zidilovo IP), Moldova & Ukraine (Isaccea IP) and Serbia potentially part of VGC.

TAP, Alexandroupolis INGS & IGB as part of a Vertical Gas Corridor. Source: DEPA – International Infrastructures.
**SECTION 3**

### SELECTED PROJECTS

#### Vertical Gas Corridor

<table>
<thead>
<tr>
<th>Project</th>
<th>Parameters</th>
<th>Capacity</th>
<th>Shareholders/Developers</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans Adriatic Pipeline (TAP)</td>
<td>878km (Kipoi-Melendugno; onshore/offshore, bidirectional)</td>
<td>10BCM/a (scalable to 20BCM)</td>
<td>BP (20%), SOCAR (20%), Snam S.p.A. (20%), Fluxys (19%), Enagás (16%) and Aexpo (5%)</td>
<td>PCI – operation by mid-November 2020</td>
</tr>
<tr>
<td>Alexandroupolis INGS</td>
<td>FSRU, permanent offshore installations &amp; subsea and onshore gas pipelines</td>
<td>5.5BCM/a nominal regasification &amp; send-out capacity /22.8MCM/d peak technical regasification &amp; send-out capacity</td>
<td>Gastrade – Copelouzos group (40%), Gaslog (20%), DEPA (20%), Bulgartransgaz (20%)</td>
<td>PCI – operation by 2022</td>
</tr>
<tr>
<td>Interconnector Greece-Bulgaria (IGB)</td>
<td>182km (Komotini-Stara Zagora; bidirectional)</td>
<td>3BCM/a (scalable to 5BCM/a)</td>
<td>ICGB – BEH (50%) &amp; IGI Poseidon (50%)</td>
<td>PCI – operation in 2Q 2020</td>
</tr>
<tr>
<td>Interconnector Bulgaria-Serbia (IBS) *</td>
<td>170km (Novi Iskar-Dimitrovgrad-Nis; bidirectional)</td>
<td>1.8BCM/a</td>
<td>Bulgartransgaz (project promoter on Bulgarian territory)</td>
<td>PCI – operation by May 2022</td>
</tr>
</tbody>
</table>

**Comments:**

- Turk Stream commissioning & the Trans Balkan reverse flow option.
- Moldova exports 1.6MCM to Ukraine for the first time via the Grebenyky IP.
- Greece-Ukraine minor physical delivery tested, although prices have not been very attractive.

*Not to be confused with Gastrans (see ECS Opinion 1/2019 on the exemption of the Gastrans natural gas pipeline project from certain requirements under Directive 2009/73/EC).*
### SELECTED PROJECTS

#### Western Balkans

<table>
<thead>
<tr>
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<th>Capacity</th>
<th>Shareholders/Developers</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionian Adriatic Pipeline (IAP)</td>
<td>511 (Fier-Split; bidirectional)</td>
<td>5BCM/a</td>
<td>Establishment of JV agreed between Albgaz, BH-Gas, Montenegro Bonus, Plinacro in 2019</td>
<td>PMI &amp; identified in the Commission’s Economic and Investment Plan for the Western Balkans</td>
</tr>
<tr>
<td>Krk LNG</td>
<td>FSRU &amp; high pressure connection pipeline</td>
<td>2.6BCM/a</td>
<td>LNG Croatia LLC – HEP (85%), Plinacro (15%)</td>
<td>PCI – operation by January 2021</td>
</tr>
</tbody>
</table>

**Comments:**

- **IAP** to europeanize & gasify energy consumption profiles of Albania, Montenegro, Bosnia and Croatia.
- Tariff & cost recovery challenges have stymied creation of a dedicated consortium.
- Krk LNG offers additional supply options for IAP’s offtakers, activating IAP’s north-south flow feature and enhancing both projects’ viability.
- Compressor enabling firm export flows across the now bidirectional Dravaszerdahely border point to play important role once Krk becomes operational.
SECTION 3

SELECTED PROJECTS

CEE (East-West)

<table>
<thead>
<tr>
<th>Project</th>
<th>Parameters</th>
<th>Capacity</th>
<th>Developer</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria-Romania-Hungary-Austria (BRUA) pipeline</td>
<td>1318km (Phase 1: Podișor-Recas &amp; compressors; phase 2: Horia-Recaș &amp; compressors; Giurgiu-Ruse &amp; Arad-Szeged pipelines; bidirectional)</td>
<td>23BCM/a (initial throughput capacity)</td>
<td>Transgaz</td>
<td>PCI – inauguration of last compressor within phase 1, phase 2 called off due to insufficient demand following open season.</td>
</tr>
</tbody>
</table>

Comments:

- ACER Decision No. 05/2019: Hungary to continue HU-AT part, via finalization of the Mosonmagyaróvár IP after performance of an economic test.

- **BUT:** Resource base as the primary issue.

  - Connection to White Stream (2nd leg of Trans Caspian Gas Pipeline) highly improbable at this stage.

  - **Romanian production, challenged by national legislation:** No shippers to use BRUA capacity without ensured offshore output & upstream projects unlikely to progress without ensured export capacity. New draft law gives glimpse of hope.
### SELECTED PROJECTS

#### CEE (North-South & inter-regional)

<table>
<thead>
<tr>
<th>Project</th>
<th>Parameters</th>
<th>Capacity</th>
<th>Shareholders/Developers</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltic Pipe</td>
<td>900km (offshore &amp; onshore – Denmark, Poland, Sweden; bidirectional)</td>
<td>10BCM/a (offshore)</td>
<td>JV between Energinet &amp; GAZ-SYSTEM</td>
<td>PCI – operation by October 2022</td>
</tr>
<tr>
<td>Świnoujście LNG terminal</td>
<td>Unloading jetty; 2 cryogenic storage tanks; regasification train</td>
<td>5BCM/a (7.5BCM/a under Expansion Program)</td>
<td>Polskie LNG</td>
<td>In operation since 2016</td>
</tr>
<tr>
<td>Klaipėda FSRU</td>
<td>FSRU Independence; high-pressure pipeline; gas metering station</td>
<td>3.75BCM/a (10.2MCM/d)</td>
<td>Klaipedos Nafta (FSRU vessel leased from Hoegh LNG)</td>
<td>In operation since 2014</td>
</tr>
<tr>
<td>Expansion of Poland-Ukraine gas interconnection</td>
<td>Upgrade of Komarno compressor (Lviv)</td>
<td>6.6BCM/a (west-east)</td>
<td>Ukrtransgaz (US-Ukraine-Poland MoU)</td>
<td>Commissioned</td>
</tr>
<tr>
<td>Balticconnector</td>
<td>152km (offshore &amp; onshore – Inga-Paldinski; bidirectional)</td>
<td>2.6BCM/a</td>
<td>Baltic Connector Oy &amp; Elering</td>
<td>PCI – commissioned</td>
</tr>
<tr>
<td>Gas Interconnection Poland Lithuania (GIPL)</td>
<td>508km (Jauniūnai GCS-Holowczyce GCS; bidirectional)</td>
<td>2.3BCM/a (scalable to 4.5BCM/a)</td>
<td>Amber Grid &amp; GAZ-SYSTEM</td>
<td>PCI – operation by late 2021</td>
</tr>
</tbody>
</table>

**Comments:**

- Access to alternative supplies from the North Sea & LNG from Baltic Sea terminals (north-south).
- Enhancement of bidirectional flows between gas transmission systems in the region.
### Applicable options

<table>
<thead>
<tr>
<th>Option</th>
<th>Supply sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas-to-Other Fuels Competition</td>
<td>CNG filling stations to L-CNG / Potential LNG receiving or liquefaction terminal in Georgia / truck loading from Russia</td>
</tr>
<tr>
<td>Gas-to-Other Fuels Competition</td>
<td>In-country mini liquefaction facility</td>
</tr>
<tr>
<td>Gas-to-Other Fuels Competition</td>
<td>Truck loading in Świnoujście/Klaipėda / In-country mini liquefaction facility</td>
</tr>
<tr>
<td>Gas-to-Gas Competition</td>
<td>In-country receiving terminal / Receiving terminals in Turkey (Marmara Ereglisi), Italy (Panigaglia), Greece (Revíthoussa, Alexandroupolis INGS)</td>
</tr>
<tr>
<td>Gas-to-Other Fuels Competition</td>
<td>In-country receiving terminal / In-country liquefaction terminal / In country mini liquefaction facility</td>
</tr>
<tr>
<td>Gas-to-Gas Competition</td>
<td>Świnoujście, Klaipėda, Revíthoussa, Alexandroupolis INGS, Krk, Marmara Ereglisi, Gdansk FSRU / Potential receiving terminal in Ukraine / Potential liquefaction terminal in Georgia</td>
</tr>
<tr>
<td>Gas-to-Other Fuels Competition</td>
<td>LNG track loading in Świnoujście/Klaipėda / Potential LNG receiving terminal in Ukraine / In-country mini liquefaction facility</td>
</tr>
<tr>
<td>Gas-to-Gas Competition</td>
<td>Świnoujście, Klaipėda, Revíthoussa, Alexandroupolis INGS, Krk, Marmara Ereglisi, Gdansk FSRU / Potential in-country receiving terminal / Potential liquefaction terminal in Georgia</td>
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<td>Gas-to-Other Fuels Competition</td>
<td>LNG track loading in Świnoujście/Klaipėda / In-country receiving terminal / In-country mini liquefaction facility</td>
</tr>
</tbody>
</table>

### Comments:

- **Regional cooperation & coordination under EaP actively evolving around LNG.**

- **New project sanctions to boost competition & liquidity, if access mechanisms ensure fair capacity utilization by market participants.**

- **BUT:** As oil-indexed contracts & firm offtake agreements fade into history, LNG project economics are exposed to largely volatile spot prices.

SECTION 4 – DECARBONIZATION

SCOPE OF THE SECTION

Assessment of the EU gas sector decarbonization via a “light” regulation for green gases & implications for CEE & SEE.
SECTOR COUPLING

- **EU SoS towards 2050**: completion of conventional gas market integration + regulation for an electron-based future.

- Need for cross-sectoral market & system approach involving both electricity & gas transmission infrastructure.

- 2030 unabated gas demand +/- 400BCM, contingent on EU econ. progress, nat. gas price competitiveness vs RES in power sector, market share of RES & electricity storage.

- **ENTSOs’ projections**: 2050 gas demand around 4,000TWh (RES-sourced H2, biomethane); unabated gas falls to 0.

- Post-2030 retrofitting of existing gas infrastructure to transport green gases (interconnectors) & manage RES’s temporal nature in line with demand (storage).

- **P2G at network scale**: gasification of RES-sourced electricity & storage or transport via same infrastructure for use or re-conversion into electricity by gas-fired power plants.

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SECTION 4
“LIGHT” GAS REGULATION

- Adaptation of existing gas regulation to the EU gas sector decarbonization could prove a tricky task, in absence of a mature and uniform European green gas industry.

- Both vertical integration & oil indexation became problems within an EU gas market whose establishment largely predated the drafting of pertinent regulation.

- Still, the EU is going to pursue this goal through a set of regulatory steps, upon release of its Hydrogen Strategy in July 2020.

REGULATORY STEPS TOWARDS 2025

- TEN-E revision;
- Review of internal gas market legislation for competitive decarbonized gas markets;
- Common quality standards or cross-border operational rules to ensure interoperability of markets for pure H2;
- Review of the Alternative Fuels Infrastructure Directive & revision of TEN-T;

HYDROGEN STRATEGY “GROUNDWORK”

Unbundling ✗
Third-party access ✓
Guarantees of Origin ✓
Tariffs ✗
SECTION 4

CEE & SEE IN THE EU GAS DECARBONIZATION AGENDA

- The EU has a norm- and standard-setting part to play on SEE’s & CEE’s energy transition.

- In doing so, it has to consider the asynchronous integration within its own energy market and those of its partner countries.

- Europeanization studies: “[...] certain political domains are much more difficult to integrate than others due to differing national interests [...]” (Saurugger, 2014.)

- SEE & CEE must finalize their conventional gas market integration, striving for liquidity, competition and price integration, prior to incorporating the decarbonization acquis.

- Completion of unbundling, third-party access & competition to ensure a level playing field for firms involved in the decarbonizing gas market.

- SEE & CEE already benefiting from EU gas market acquis (reconsideration of Gazprom export strategies → spot indexation of LTCs, auctions & direct sales on ESP, LNG deliveries, no destination clauses.)

- Gas decarbonization acquis must not fragment individual markets, as re-adaptation requires time.
SECTION 4

CEE & SEE IN THE EU GAS DECARBONIZATION AGENDA


- Challenges & opportunities on gas sector decarbonization to be assessed jointly with the IEA & the Fuel Cells and Hydrogen Joint Undertaking.

- EU Hydrogen Strategy explicitly referring to the Energy Community CPs.

- Green gas investment boost → e.g. EBRD to explore Georgia’s RES-sourced H2 production potential & help upgrade existing gas assets for blended H2 transport.

The Central and South-Eastern European energy connectivity high-level group reinforces regional cooperation.

Georgia joins the race to produce green hydrogen.
CONCLUSIONS

- CEE & SEE on a path towards gas market integration, helped by new infrastructure investments to the north of the SGC & LNG supplies from the Baltic Sea.

- Their small size and modest consumption profiles have prevented them from noting quick progress (*exception:* Romania.)

- Both lack TSOs operating large asset bases (*exception:* Ukraine.)

- Therefore, new interconnectors & LNG terminals have to be constructed and, to a large extent, supplied by third countries (Norway, US, Caspian & Central Asia, Middle East.)

- In this respect, the EU has to support the two regions both politically and financially.
CONCLUSIONS

Short- and long-term steps towards CEE’s & SEE’s alignment with the gas decarbonization acquis:

- **Short-term (mid-2030s):** Incorporate existing gas market software, complete bidirectional infrastructures across the North-South/East-West corridors & LNG terminals, seamlessly depoliticize external gas relations and leave zero room for monopolistic trading practices;

- **Long-term (2050s):** Constantly advocate natural gas as a suitable substitute to more polluting options and progressively replace unabated gas with green gases.

Preconditions for a smooth transposition of the gas decarbonization acquis:

- Integration of infrastructure investments with policies to enable uniform sector coupling;

- Aversion of national market fragmentations.
THANK YOU

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