Latvian Gas Market in Transition – Challenges of Inčukalns Underground Gas Storage

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Background: general facts about Latvia

- Area: 64 589 km²
- Population: 1.95 MLN
- GDP per capita (PPP): 27 291 USD
- Internet speed: 13.8 MB/s
- Memberships:
  - EU: 2004
  - NATO: 2004
  - EuroZone: 2014
  - OECD: 2016
I. Natural gas market

II. Gas infrastructure

III. Role of Inčukalns Underground Gas Storage

IV. Future implications
I. Structure of Natural Gas Consumption in Latvia

I. Energy mix of Latvia

I. Natural gas consumption in Baltic region

<table>
<thead>
<tr>
<th>Year</th>
<th>Latvia</th>
<th>Lithuania</th>
<th>Estonia</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>18,933</td>
<td>32,075</td>
<td>7,299</td>
<td>24,651</td>
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<td>2009</td>
<td>15,000</td>
<td>23,103</td>
<td>5,469</td>
<td>23,103</td>
</tr>
</tbody>
</table>

I. Demand in electricity sector: Hourly electricity prices in NordPool

Source: Nord Pool, 'Historical Market Data, Elspot Prices, 2017', www.nordpoolgroup.com,
I. Demand in Electricity sector: Monthly electricity prices in NordPool

I. Latvian Gas Market Opening

- April, 2017 - JSC «Latvijas Gaze» is split up into two independent «sister» companies with the same ownership structure (transmission & storage and trade & distribution).

- April, 2017 - all natural gas users have the right to freely choose a natural gas trader. Regulated prices for households.

- December, 2017 - 35 registered gas traders.

- December, 2017 - ownership unbundling of transmission system and storage system operator has to be completed.

- January, 2018 - unbundling of distribution system operator has to be completed.
I. Spin-off of JSC «Latvijas Gaze»

1991-2016

01/2017

Trade, distribution

12/2017

Transmission, storage

GASO

Trade

Distribution

Trade, distribution, transmission, storage
II. Natural gas supply system in Latvia

- Transmission network – 1198 km, distribution network – 5055 km.
- 442,8 thousand consumers.
- The natural gas system operates without congestions (40% backup capacity).
- Inčukalns Underground Gas Storage
- Klaipeda LNG
II. Future Gas Infrastructure Development

- Interconnection Estonia – Finland, Balticconnector, 2019
- Enhancement of EE-LV interconnection, 2019
- Enhancement of Inčukalns Underground storage, 2019
- Enhancement of LV-LT interconnection, 2020
- Poland – Lithuania interconnection GIPL, 2021

III. Inčukalns IUGS

- Acquifer type
- Total capacity: 48 TWh
- Working gas volume 24.2 TWh
- Injection max 190 GWh/d;
- Withdrawal max 295 GWh/d.
- Operated by JSC Conexus Baltic Grid
- Regulated third party access regime
III. Challenges of Inčukalns underground gas storage

- Use of storage in 2017/2018 storage season decreased from typical ≈22 TWh to 15 TWh
  - Storage costs have not significantly dropped as ≈ 90% are fixed

- Decrease in general natural gas consumption in LV and entire Baltics

- Greater reliance to gas pipeline deliveries during the heating season
  - Risky due to potentially insufficient gas flow from Russia during very cold days (-15C and lower) due to infrastructure restrictions within Russia
III. Withdrawal capacity dependence on active gas volume in storage

Source: JSC Conexus Baltic Grid
IV. IUGS demand drivers

- Commercial interests:
  - Utilizing Winter and Summer price spread (currently < 1 EUR/MWh)
  - Price insurance for 3 winter months (compared to alternative of gas purchasing based on imbalance prices)

- Balancing purposes (short-term)

- Security of supply
  - Ensures pressure in the system,
  - Sufficient withdrawal rate in spring (~3,16 TWh in March),
  - Strategic reserves for captive consumers (SoS Regulation)
Market based product:
- Price is determined weekly: Gaspool Winter 2018 forward price minus Gaspool front month forward price,
- Minimum level: 0.92 EUR/MWh,
- Price for virtual counterflow: 0.322 EUR/MWh,
- Secondary priority booking of storage injection and withdrawal
- Additional cost for gas injection of ~ 1.2% of the volume

Standard product:
- Maximum level for 2018/2019 is set at 2.95 EUR/MWh,
- Virtual counterflow: 0 EUR/MWh,
- Priority booking of storage injection and withdrawal capacities.
- Additional cost for gas injection of ~ 1.2% of the volume

Auctions
IV. A Way Forward

- Flexible market based storage products
- Implementation of Regional Infrastructure projects
- Development of Baltic common gas market (FI, EE, LV, LT)
  - Internal interconnection points removed
  - Common balancing rules
  - Common entry tariffs
  - Inter TSO Compensation mechanism
Thank you!

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The last tariff prior liberalization was confirmed in 2008 and was valid (with minor transformations in 2017) until June 1 2018:

- Storage tariff: 1,504 EUR/MWh/Storage cycle,
- Entry tariff to storage: 0,0475 EUR/MWh
- Exit tariff from storage: 0,0473 EUR/MWh
- Virtual counterflow can be used without limitations any time.

Total costs of storage considering financing was ca 1.80 EUR/MWh
- Sufficiently low to utilize seasonal contract price spreads
Gas Exchange - GET BALTIC; fulfilled trades

Volume traded, MWh
Weighted average price, EUR/MWh