TYNDP case study of Hungary

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Contents

• Hungarian gas market
• Infrastructure development
  – process
  – result
Primary energy sources [%]

- Solid: 14.1%
- Crude oil and products: 33.8%
- LPG: 0.4%
- Primary electricity: 39.7%
- Natural gas: 12.0%
Gas Transmission System

- Total length: 5928 km
- 5 Compressor stations (135 MW)
- 408 delivery stations

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>4,4</td>
<td>Bcm</td>
</tr>
<tr>
<td>14,4</td>
<td>Mcm</td>
</tr>
<tr>
<td>2,2 (5,3)</td>
<td>Bcm</td>
</tr>
<tr>
<td>6,0 (14,4)</td>
<td>Mcm</td>
</tr>
<tr>
<td>13,2</td>
<td>Mcm</td>
</tr>
<tr>
<td>4,8</td>
<td>Bcm</td>
</tr>
<tr>
<td>6,5</td>
<td>Bcm</td>
</tr>
<tr>
<td>19,2</td>
<td>Mcm</td>
</tr>
</tbody>
</table>

Source: FGSZ
Distribution System

Distance:

- **2.823 supplied settlements**
- **Percentage: 92,1 %**

Length of pipelines: 84.216 km

Source: MEKH
In accordance with the Act 26 of 2006 on the Security Storage of Natural Gas:

A new strategic storage facility had been constructed until 1 January 2010 (Algyő gas-field, at the Szőreg-I layer in Southern Hungary). Operator: MMBF

Working gas capacity: **1.2 Billion m³**
Withdrawal capacity: **20 Million m³/d** (for min. 45 days)

For the exclusive supply of households and communal consumers, only in emergency situation

In the same facility MMBF had got a license and made a development for commercial storage with

Working gas capacity: **700 Million m³**
Withdrawal capacity: **5.0 Million m³/d**
Storage System

<table>
<thead>
<tr>
<th>Storage Unit</th>
<th>Working gas capacities [MMm³]</th>
<th>Peak withdrawal capacities [MMm³/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Zsana</td>
<td>2 170</td>
<td>28.0</td>
</tr>
<tr>
<td>2 Hajdúszoboszló</td>
<td>1 640</td>
<td>20.8</td>
</tr>
<tr>
<td>3 Pusztaederics</td>
<td>340</td>
<td>3.1</td>
</tr>
<tr>
<td>4 Kardskút</td>
<td>280</td>
<td>3.2</td>
</tr>
<tr>
<td>5 Strategic UGS</td>
<td>1 200</td>
<td>20.0</td>
</tr>
<tr>
<td>Szőreg-l. commercial</td>
<td>700</td>
<td>5.0</td>
</tr>
</tbody>
</table>

**TOTAL** 6330 80.1

Total injection capacity: 45.9 MMm³/day

Source: MEKH
## Technical Capacities of the Gas System

<table>
<thead>
<tr>
<th>Gas Supply Sources</th>
<th>Capacity Mm³/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine (Brotherhood pipelines)</td>
<td>45.0</td>
</tr>
<tr>
<td>Ukraine (transit)</td>
<td>11.3</td>
</tr>
<tr>
<td>Austria (HAG)</td>
<td>14.4</td>
</tr>
<tr>
<td>Slovakia</td>
<td>12.0</td>
</tr>
<tr>
<td>Croatia</td>
<td>19.2</td>
</tr>
<tr>
<td>Romania</td>
<td>4.8</td>
</tr>
<tr>
<td>Domestic production</td>
<td>8.0</td>
</tr>
<tr>
<td>Underground gas storages</td>
<td>60.1</td>
</tr>
<tr>
<td><strong>Subtotal:</strong></td>
<td><strong>174.8</strong></td>
</tr>
<tr>
<td>Strategic storage</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>194.8</strong></td>
</tr>
</tbody>
</table>

Source: MEKH
## Gas Supply 2016

<table>
<thead>
<tr>
<th>Description</th>
<th>BCM</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Hungarian Consumption</strong></td>
<td>9.594</td>
<td>100</td>
</tr>
<tr>
<td>Domestic Production</td>
<td>1.564</td>
<td>16.3</td>
</tr>
<tr>
<td>Imports (diversified)</td>
<td>10.530</td>
<td></td>
</tr>
<tr>
<td>- <strong>Eastern Direction (UKR → HU)</strong></td>
<td>4.637</td>
<td>48.3</td>
</tr>
<tr>
<td>- <strong>Western Direction (AUT → HU)</strong></td>
<td>3.965</td>
<td>41.3</td>
</tr>
<tr>
<td>- <strong>Transit (to Serbia and Bosnia)</strong></td>
<td>1.928</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>1.068</td>
<td></td>
</tr>
<tr>
<td>Storage Withdrawal</td>
<td>2.903</td>
<td></td>
</tr>
<tr>
<td>Storage Injection</td>
<td>2.417</td>
<td></td>
</tr>
</tbody>
</table>

**Security of Supply • Affordability • Quality of Life**
Contents

• Hungarian gas market
• Infrastructure development
  – process
  – result
Infrastructure Development

• The Transmission System Operator (TSO) coordinates
  – The systematic review of the capacity of the interconnected natural gas system
  – The planning of future developments.

• System operators and system users yearly should assess their available capacities.

• To plan the developments the TSO shall establish a database on the national natural gas supply network.
Database

• For setting up and updating the database System Operators and System Users should give data to the TSO.

• The Office and the TSO shall *negotiate* the structure of the database.

• The database may not contain any personal data or commercially sensitive information.
Database shall inter alia contain the following components:

- **technical specifications** of transmission pipelines, including transfer facilities;
- **consumption data** on transmission and distribution pipelines, separately for each transfer facility;(delivery stations)
- **customer demand estimated** for a period of ten gas years beginning in the current gas year, broken down per year and per transfer facility, and consumption data forecasted for the tenth gas year broken down according to transfer facilities;
- information relating to natural gas **production** and flows of natural gas at system interconnection points;
- the **approved domestic ten-year** development plans relating to transmission and distribution lines, and natural gas storage facilities;
- **ten-year development plans for regional and Community-wide networks**;
- **financial** and business information for the planning of developments.
Data >>>> Plan

TSO

SSO

DSO

Harmonised proposal

TSO shall submit the differing opinions too

Trade organisation, public consultations

Office

Till 30. April
Demand of customer 1st April

The result of the capacity assessment and the development plans until 31st August

Security of Supply • Affordability • Quality of Life
Based on the system operator yearly capacity assessment, the system operator shall propose a ten-year development plan for the TSO.

TSO shall use the technical and commercial planning methods

- Modell based on network diagnostic method
- Exit ponts pressure calculation with the informatic programs taking into consideration the demand
- At the maximum consumption the pressure should remain above the minimum level
• The TSO shall review the development plan every year and shall revise it where deemed necessary, relying on indicators of past - and estimated future - performance, and demand projections.

• the Office shall - if deemed necessary - conduct public consultation with the network users about the network development plan and shall record the results in a report.
Office system monitoring responsibility

• shall check - with experts - the results of the capacity assessment and infrastructure development plan submitted by TSO, and

• In connection with cross-border capacity investments, the Office shall consult the relevant authorities of the country affected concerning the sharing of costs and the technical and economic parameters of the investment.
Office system monitoring responsibility

- Office should take into consideration
  - Hydraulic matching
  - Reasoning of the development
  - Connected system operator opinion
  - Cost of the development
  - Development effect on the tariff structure
  - In the case of cross border investment the opinion of the other country authorities

- shall check whether it is consistent with the previous development plan.
Office system monitoring responsibility

• If the infrastructure development plan is found
  – inconsistent with national or Community-wide energy policy objectives or
  – hindrance of national economy objectives,
  – unlawful or
  – if it is an impediment to effective market competition,
• the Office shall notify the Government and may order the TSO to rework the plan within the deadline prescribed, with the reasons indicated.
Office system monitoring responsibility

• shall check whether the network development plan is consistent with the Community-wide ten-year network development plan
• If any doubt arises, the Office shall consult ACER prior to adopting a decision.
• If the network development plan is found
  – inconsistent with the Community-wide ten-year network development plan,
  – it is unlawful or
  – if it is an impediment to effective market competition,
• the Office may order the TSO to rework the plan within the deadline prescribed, with the reasons indicated.
Office approval

• The Office shall approve the ten-year network development plan and shall lay down the **conditions** of approval.

• **The resolution** of the Office shall contain
  – the technical specifications for each investment project,
  – including deadlines,
  – the sharing of costs between participants,
  – the changes recommended by the Office, and
  – the foreseeable impact of the projects on the security of supply in Hungary.

• The resolution of the Office shall contain, the investments which have to be executed within the **next three years**, and any changes in the investments already approved in the previous development plan.
Office approval bi-directional capacity

• In the case of bi-directional capacity the Office shall forward the proposal for without delay (within two months) to the European Commission and the Member States affected for issuing an opinion.

• The Office shall send
  – the draft-resolution - while suspending the proceedings - without delay to the European Commission,
  – together with all relevant information showing the reasons for the decision,
  – for the purpose of conducting the procedure.

• After the European Commission procedure, the Office shall deliver the resolution to the applicant.
Operation licence amendments

• Before the beginning of a given investment the system operator shall apply for the amendment of his operating license.

• The investment may begin in possession of the amended authorization only.

• Where a new, unplanned capacity request arises and it can be satisfied merely by the expansion or modification of the transfer facility (delivery station), it could be implemented outside the ten-year development plan.
Failed investment

• If the system operator fails to complete the investments according to the timetable laid down in the approved development plan, the Office may organize a tender procedure for carrying out the investments which are still considered relevant,

• The tender notice shall be published on the official website of the Office at least six months prior to the planned deadline of the submission of tenders.

• System operators shall tolerate the implementation of network improvements following the tender procedure, and shall cooperate with the developer carrying out the improvements.
Outcome of the tender

• Depending on the outcome of the tender procedure, the Office may oblige the system operator to agree to one or more of the following:
  – **financing** the investment in question by any third party;
  – **construction** of the investment in question by any third party;
  – building the new assets concerned **itself**;
  – as regards the system operator designated, operating the new asset concerned itself.

• The TSO shall provide investors with all information needed to realize the investment, lay down the conditions for connecting the new assets to the interconnected natural gas system and shall generally make its best efforts to facilitate the implementation of the investment project.

• The financial arrangements required to realize the investment shall be subject to prior approval by the Office.
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Domestic consumption, Mrdm³/year

Between 2005-2014 decrease with a trend

From 2015 increase

Between 2007-2015 3 Mrdm³ decrease, 2/3 of it power plant consumption decrease
In 2016 10 year development prognosis for consumption, Mrdm³/year

- System users prognosis
- Present customer demand will increase a little bit
- The increase of the consumption of power plant depends on the gas price and the electricity price ratio
Prognosis of the Production, Mrdm$^3$/year

10 éves hazai nettó termelési adat tény és előrejelzés (éves)

1,12 Mrdm$^3$/year decrease
Gas import should increase
• 9.9-12.6 Mrd m³/year import demand
• Presently 84% import dependence level by 2027 95-96% increase
• Very important the source and the transmission route diversification
Thank you for your kind attention!