



Natural Gas Security Of Supply in Europe and Hungary

**13th meeting of the
GROUP OF EXPERTS
ON SUPPLY AND USE
OF GAS**

Tamás Kőrösi
Chairman



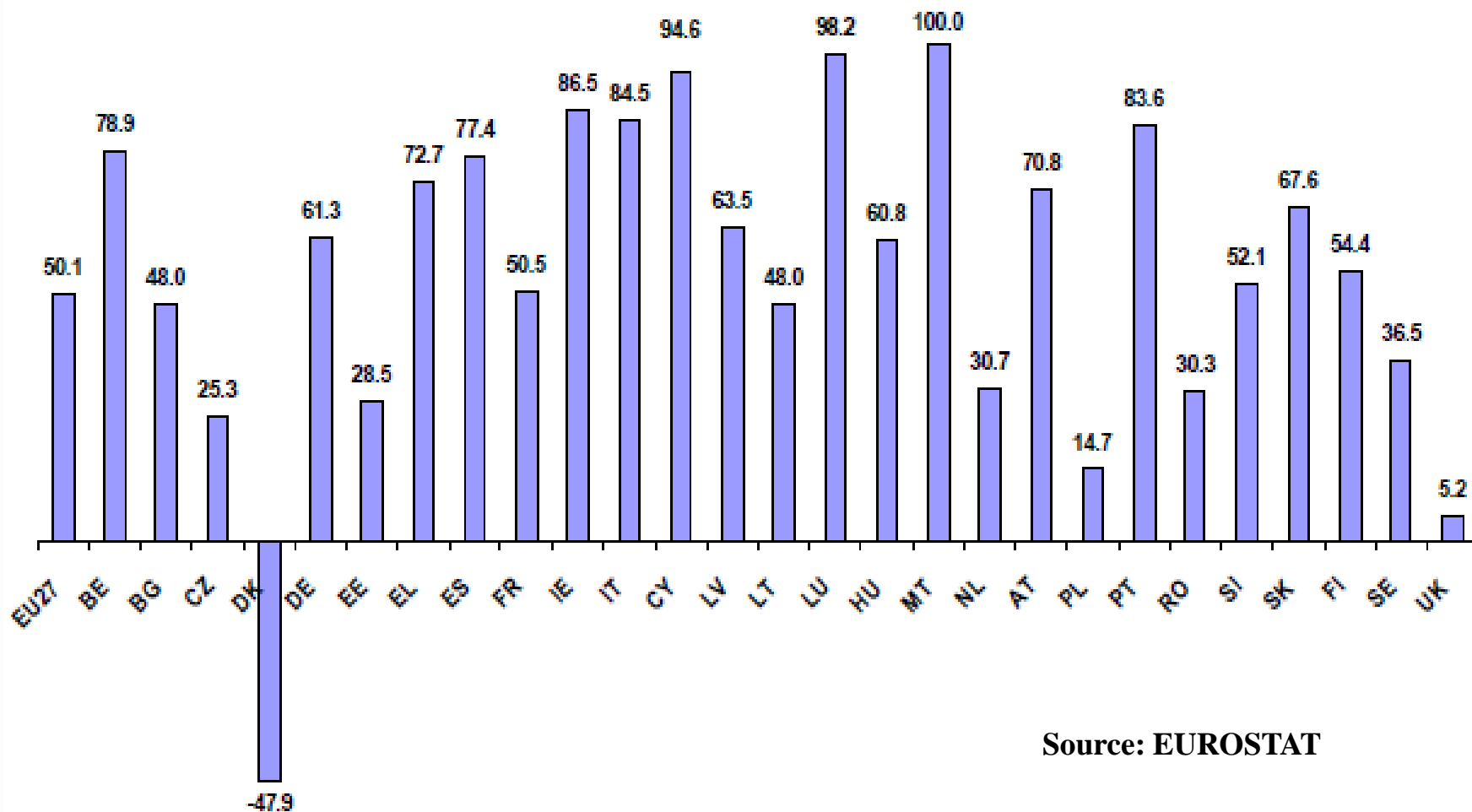
Geneva, 23rd January, 2013

Agenda

- **European overview**
 - Energy import dependency
 - Dominancy of Russian Gas
 - European and neighbouring gas reserves
 - European gas supply routes
 - LNG supply
 - North-South Corridor
 - Southern Corridor
 - Gas storage overview
 - EU Regulation 994/2010 on Security of Supply
- **Security of gas supply in Hungary**
 - Primary energy sources
 - Gas supply crisis, January 2009
 - Role of Russian import
 - Development in transmission
 - Strategic storage
 - Development in storage
 - Total capacities of the network

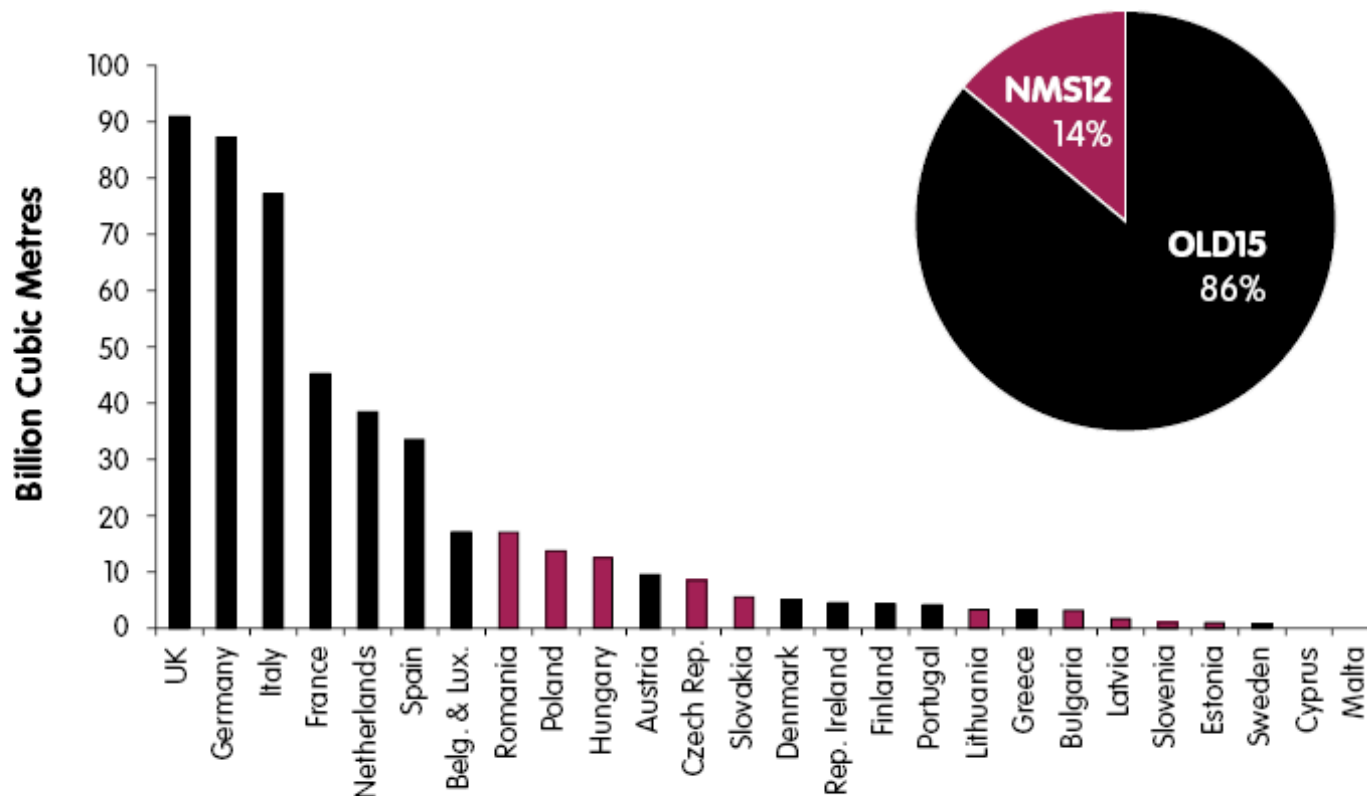
Strategic problem of the EU:

High energy – import dependency %



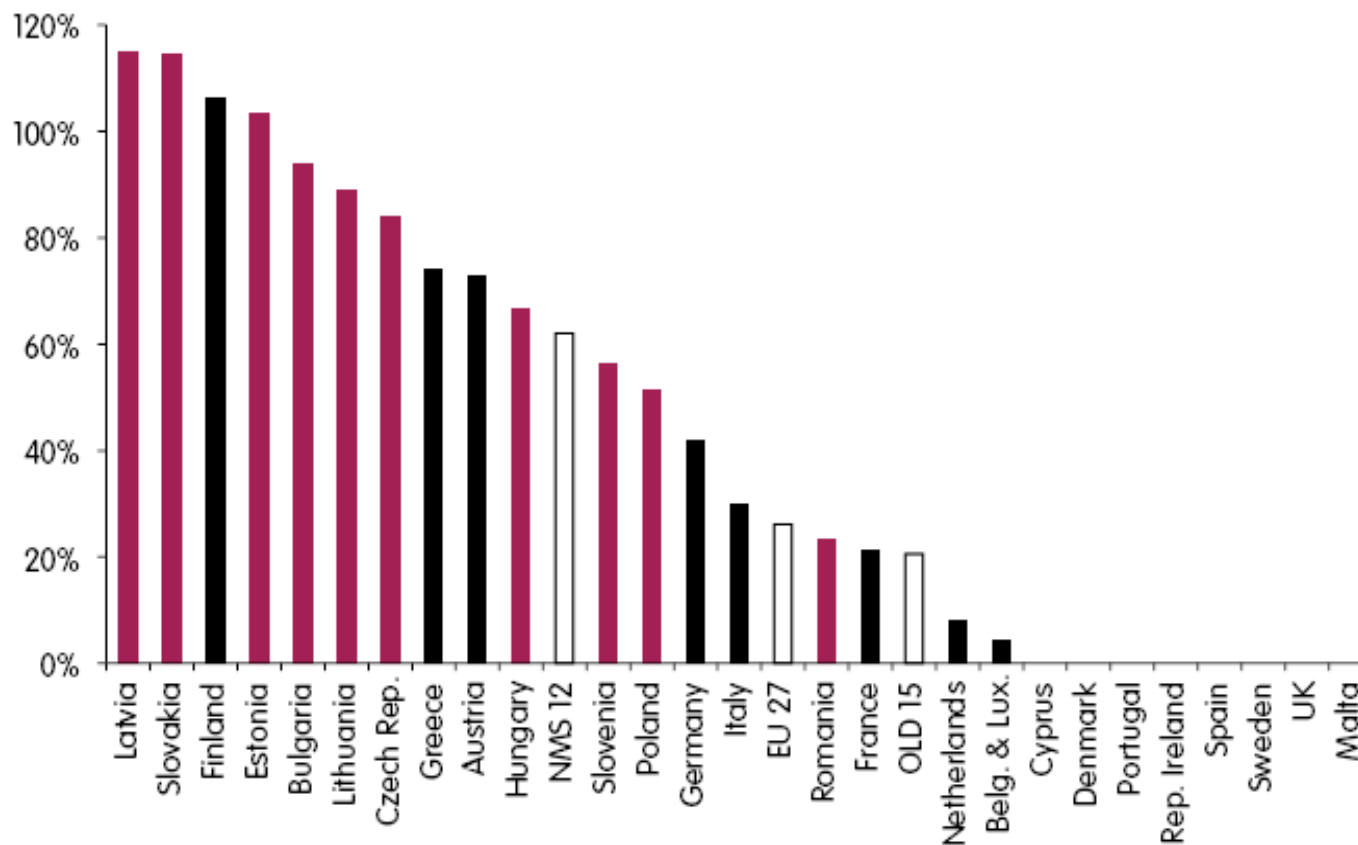
Source: EUROSTAT

EU 27 Gas Consumption



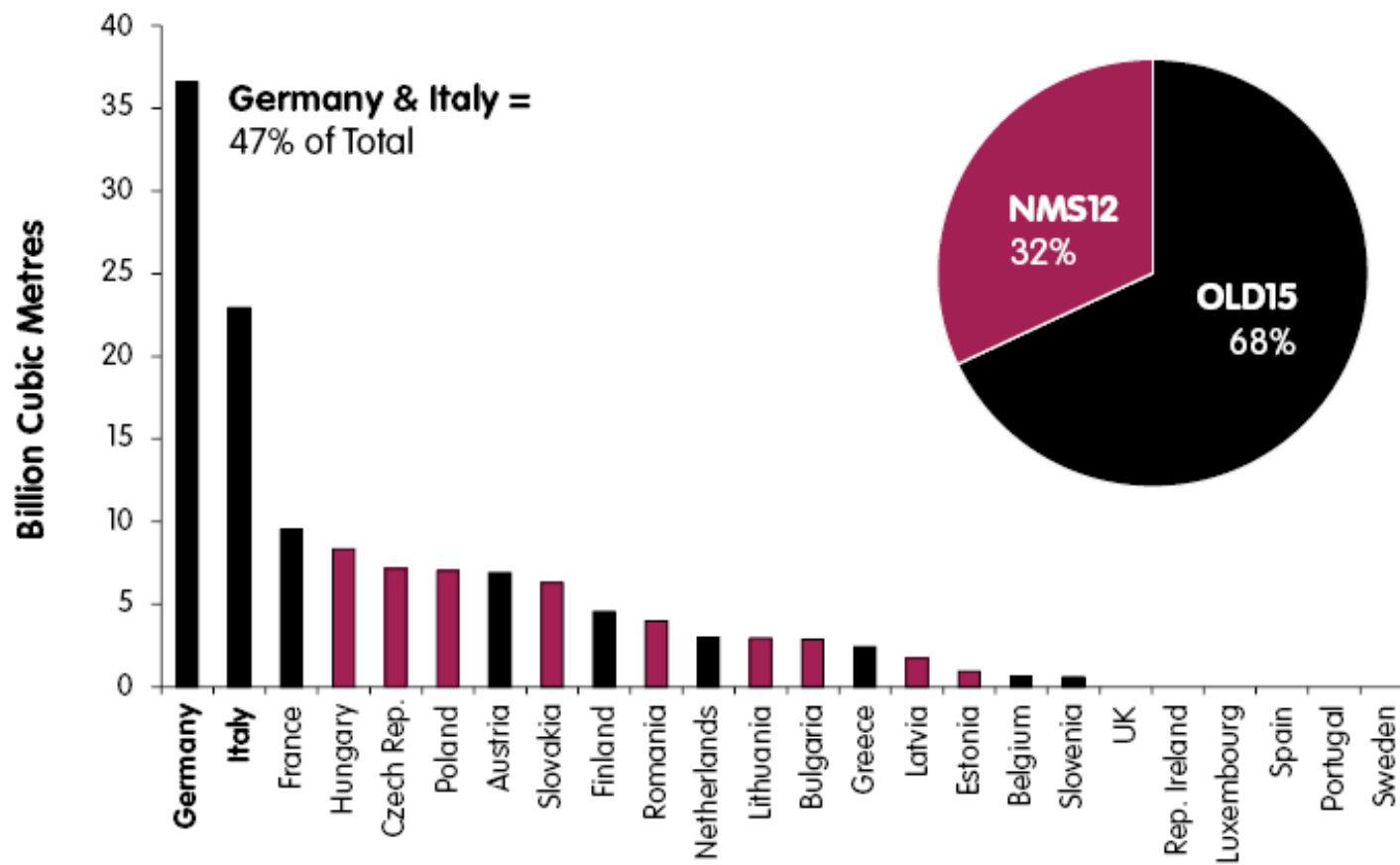
Source: EC. DG Ener

EU 27 Russian Gas Import Dependency



Source: EC. DG Ener

EU 27 Russian Import Quantities



Source: EC. DG Ener



European and Neighbouring Gas Reserves

Total World reserves: 187100 BCM; EU-27 Import: ~300 BCM/year

Source: BP

Norway: 1,1 %

The Netherlands: 0,6 %

Russia: 23,9 %, 44800 BCM

Middle-Asia

Turkmenistan: 4,3 %

Uzbekistan: 0,8 %

Kazakhstan: 1,0 %

Ukraine: 0,5%

Middle-East:

Iran: 15,8 %

Qatar: 13,5 %

Saudi A.: 4,3 %

UAE: 3,2 %

Iraq: 1,7 %

Algeria: 2,4 %

European Gas Supply Routes

Existing and Planned (P) Transmission Pipelines

Total Russian: ~300 BCM, Nabucco 31(-10) BCM

Import Choice:

- Russia;
- Middle-East;
- LNG (Algeria, Qatar, Nigeria)

**North Stream
Russian-German
Pipeline, Ready**

**Russian Sources
GAZPROM**

Brotherhood

**Slovakian
Connect, P**

South Stream, P

Blue Stream, P

**Croatian LNG
Terminal, P**

Plan

LNG

LNG

Nabucco, P

55 mrd m³

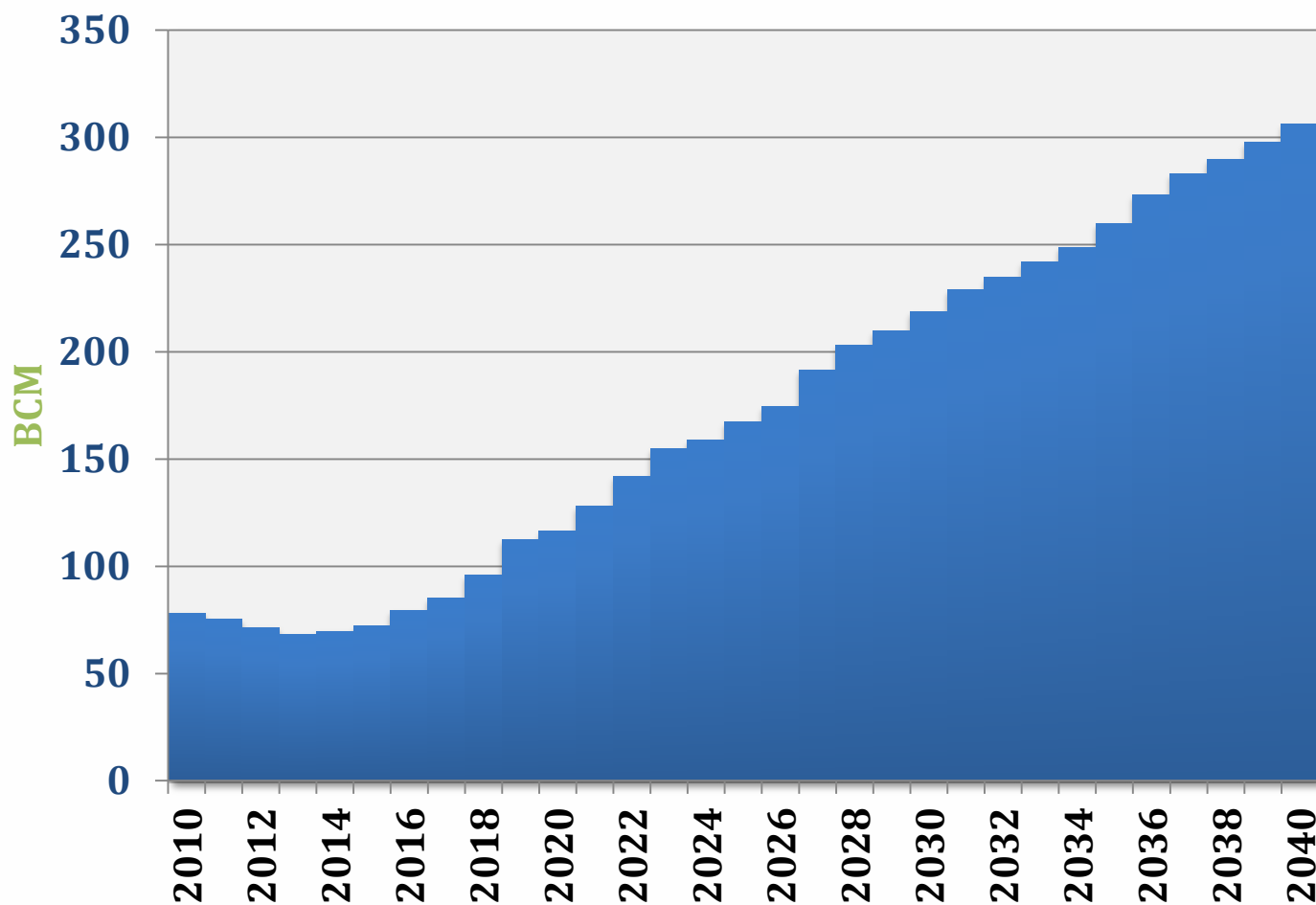
150

61

16

31

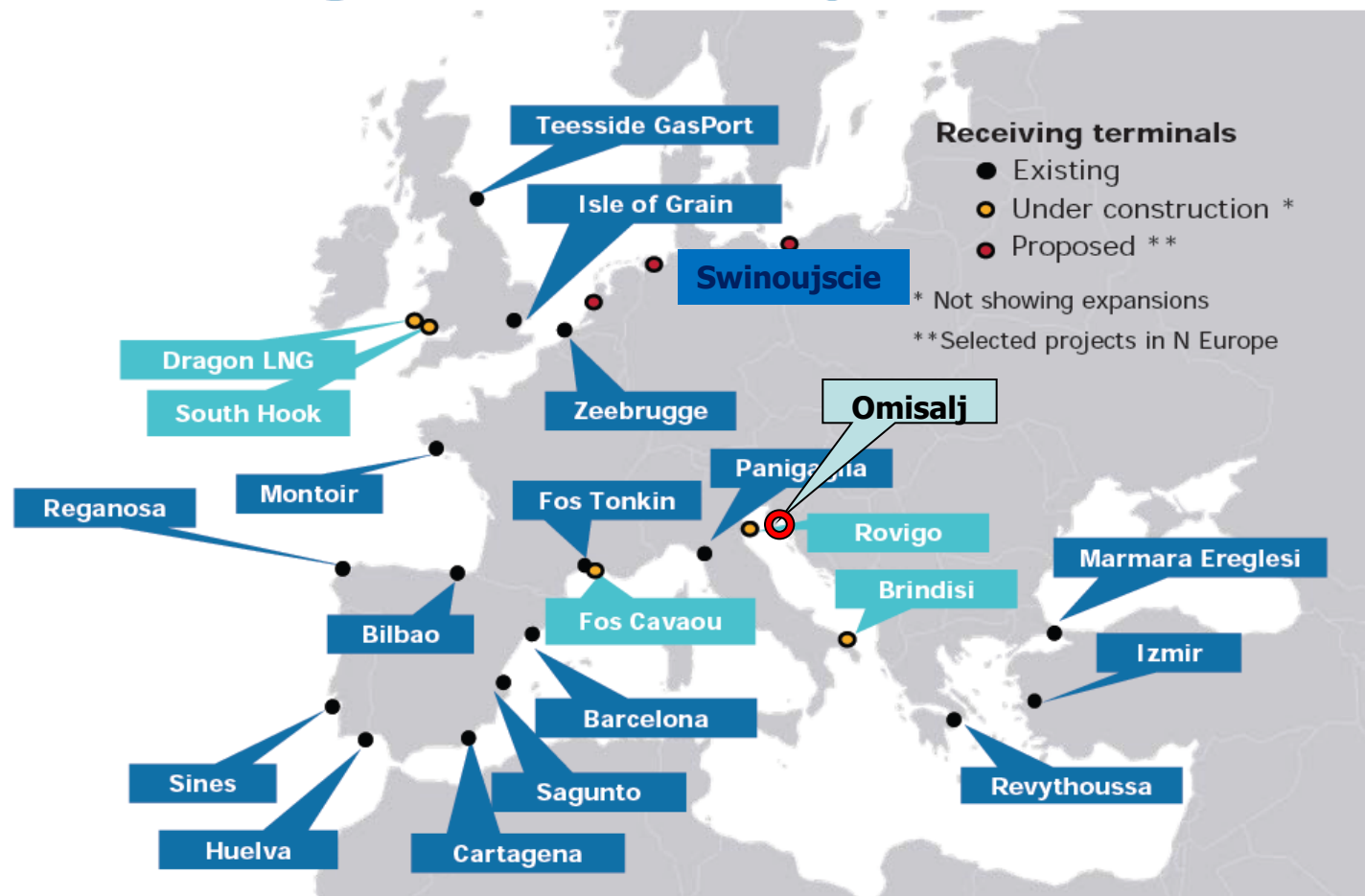
European LNG Import Forecast



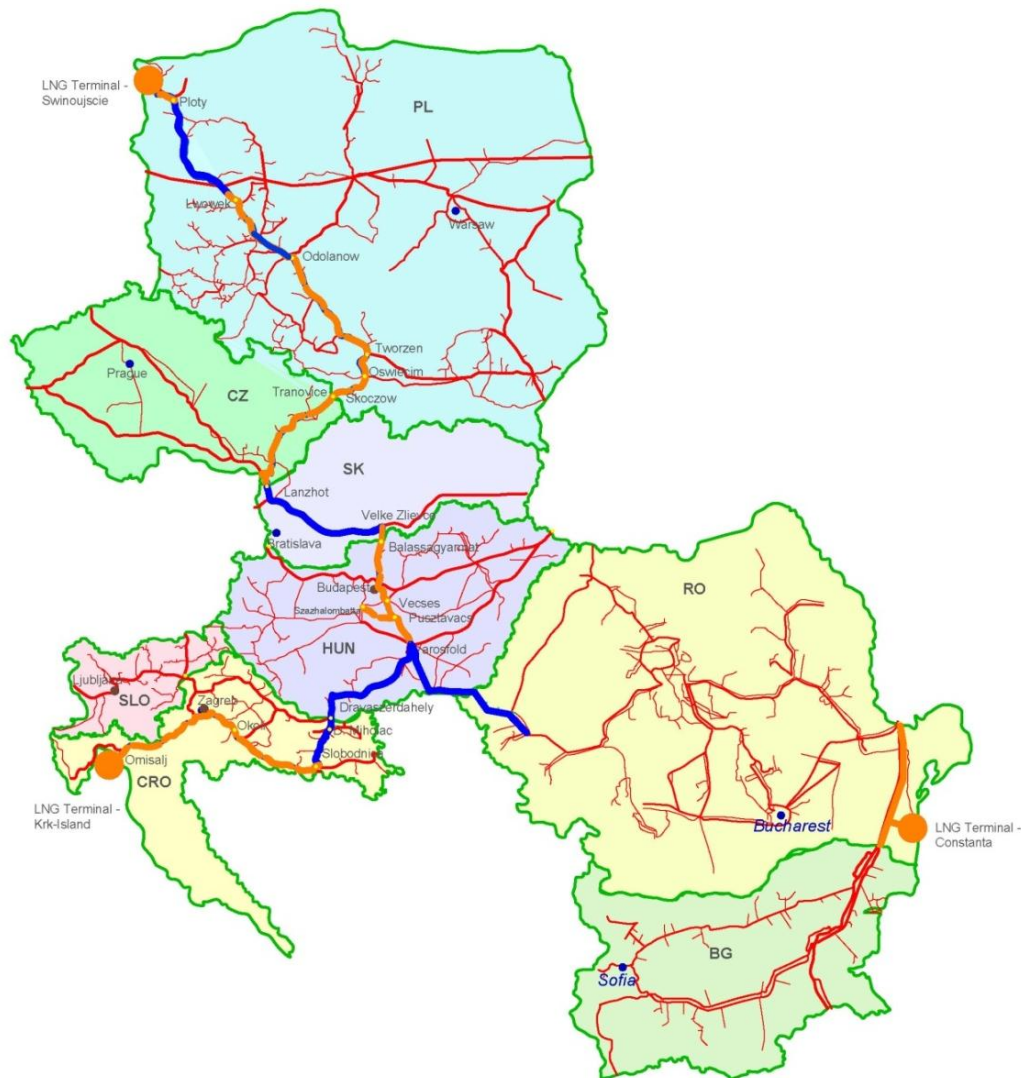
Source: European Commission, DG ENER

LNG Terminals in Europe

LNG receiving facilities in Europe



North-South Corridor



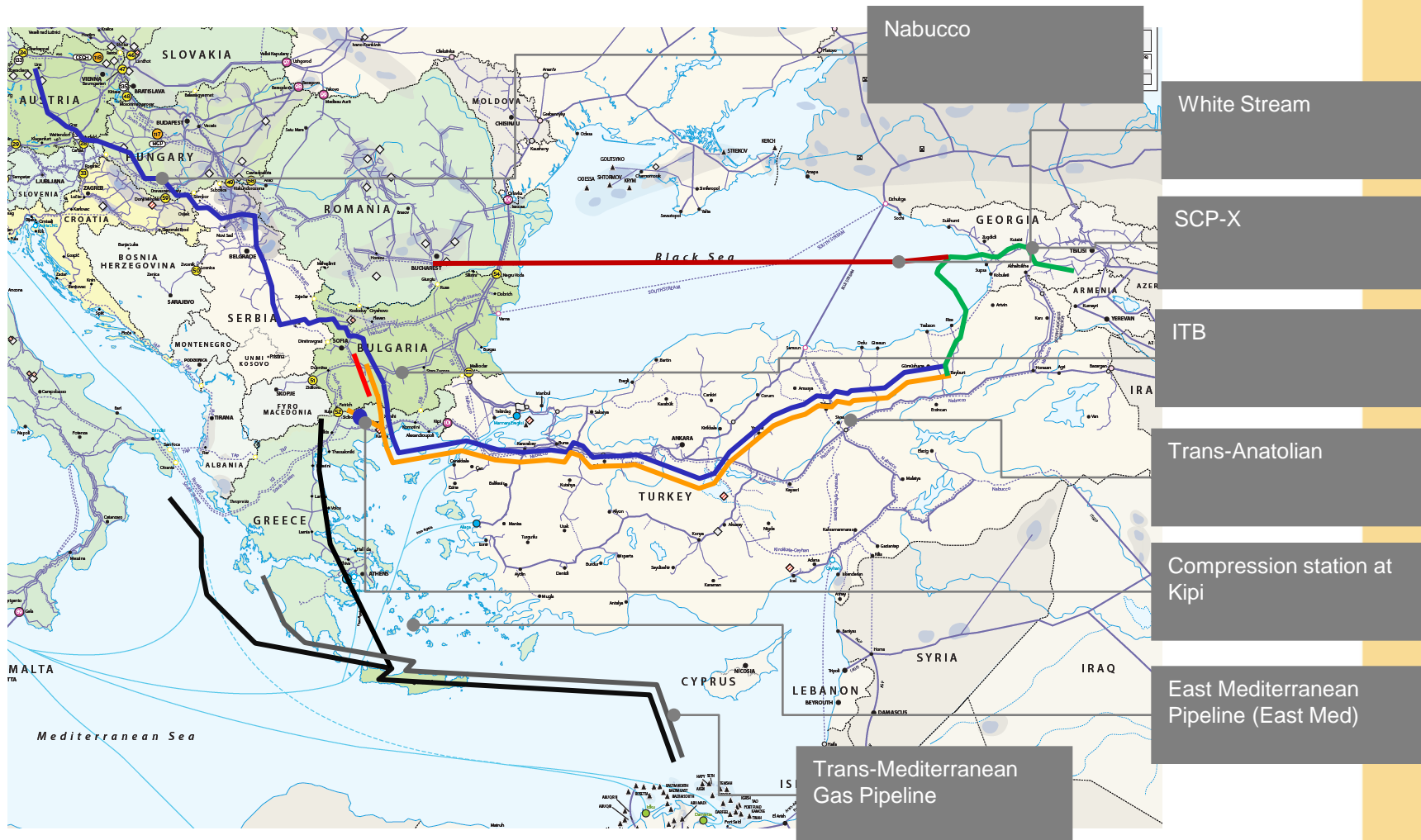
Source: European Commission, DG ENER

Orange line: New pipelines
Blue line: Existing pipelines



Southern Gas Corridor

Current projects on the SGC list



Source: European Commission, DG ENER

Southern Gas Corridor

Current projects on the SGC list

Trans-Anatolian

- New 50" inch gas pipeline with overall length of approximately 2000 km and approximate capacity of 16 bcma in the beginning, expandable up to 32 bcma, originating at the Eastern and exiting at the Western border of Turkey with Bulgaria/Greece.

Nabucco West

- The pipeline will cross Turkey, Bulgaria, Romania and Hungary and run to Austria. Construction is anticipated to commence in the year 2013. Start of operations is expected in 2018

Compression station at Kipi

- This project consists in the installation of a compressor station at the GR/TR border that will greatly increase the capacity of the Turkey-Greece interconnector. This project is necessary both for the increase of the import of gas by Greece from eastern sources as well as for the operation of the projects: IGI-Poseidon, IGB and TAP, sponsored by third parties

ITB

- Pipeline of 200km (75km on the Bulgarian territory and 125 on the Turkish territory) between the compression station located in Lozenetz and the gas metering station of Malkochlar. The capacity of the pipeline will reach 3-5bcm/a in the first phase and will reach 9bcm/a in a second phase

White Stream

- Capacity will be built up in stages using multiple offshore strings, WS will provide flexibility in terms of timing of each increment of capacity. Reinforces route through Turkey.

Trans-Mediterranean Gas Pipeline

- Transmission pipeline for the transport of natural gas from the Levantine Basin into Greece's National Gas Transmission System, through Cyprus. The proposed gas transmission pipeline will have a total length of around 1,400km and could allow for reverse flow. Other relevant project infrastructure (facilities) includes three compressor stations – one located onshore Cyprus, the second onshore Crete (Greece) and the third onshore mainland Greece.

East Mediterranean Pipeline (East Med)

- It will carry around 8 billion cubic meters annually and it is estimated that it will be around 1100 kilometers in length. East Med is considering a landfall in Crete before its final destination the mainland of Greece which could also allow the off take of gas in Crete.

SCP-X

- This upgrade of the South Caucasus Pipeline (SCP) runs in the same corridor as the Baku-Tbilisi-Ceyhan pipeline. The expansion includes around 400km of 56" diameter pipeline looping in Georgia along the existing right of way and the construction of two additional compressor stations in Georgia.

Gas Storage overview

**Source:
New UN ECE
Study on UGS**

Total UGS working gas volumes [Million m³] of European countries on 31 December 2011	
Austria	4184
Belgium	700
Bulgaria	500
Croatia	600
Czech Republic	3200
Denmark	1000
France	12700
Germany	20200
Hungary	6100
Ireland	230
Italy	15725
Latvia	2300
the Netherlands	5200
Poland	1800
Portugal	180
Romania	2800
Slovakia	2800
Spain	2700
Sweden	9
Turkey	1600
United Kingdom	4600

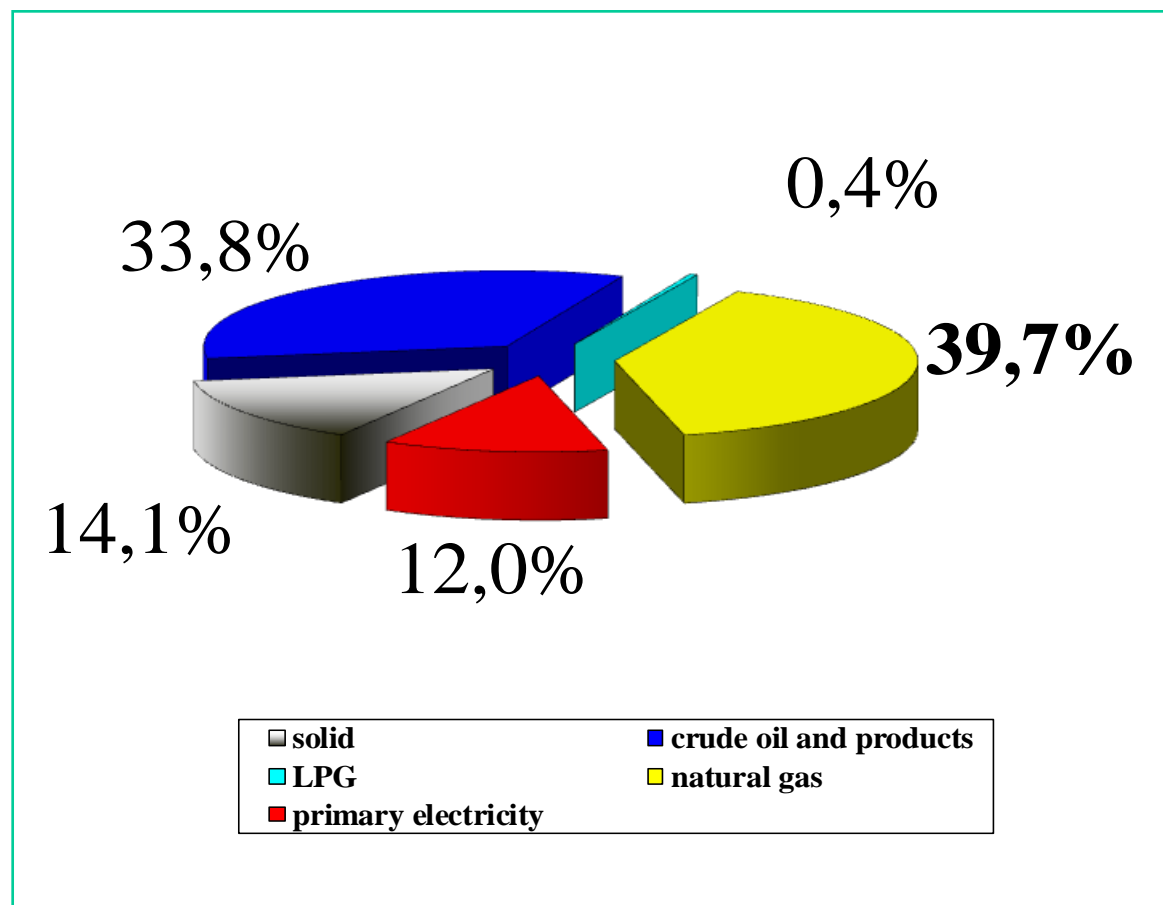
EU Regulation 994/2010 on SoS

Main prescriptions:

- Creation of reverse flow availability on every interconnector pipeline until the end of 2012 (or request for exemption)**
- Risk Assessment of gas supply in every Member State until 3rd December 2011**
- On the base of the Risk Assessment:**
 - Emergency Plans**
 - Preventive Action Plans**

Role of Natural Gas in Hungary

Primery energy sources



Natural Gas Supply 2012

	BCM	%
Total Hungarian Supply:	10.24	100
Domestic Production:	2.07	20.2
Imports (diversified):	8.17	79.8
Eastern Direction:	3.57	34.9
Western Direction :	4.60	44.9

Managing the Gas Supply Crisis, January 2009

MMCM/day

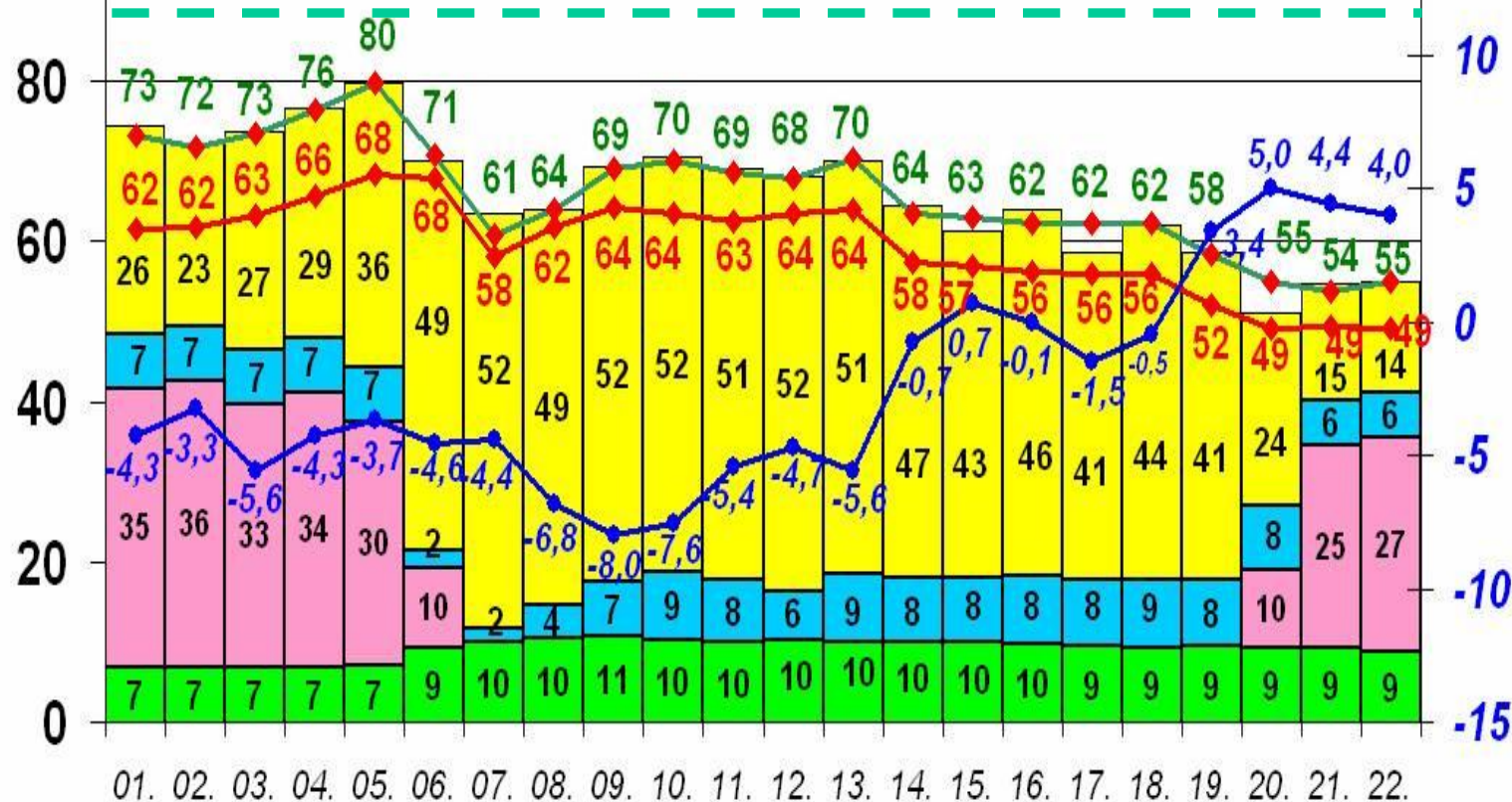
Significant role of underground gas storage!

°C

100

15

Absolute peak (highest total consumption ever): 89,74 MMm³/day (February 9. 2005)



Production
Consumption

Imports-East
Consumption+Transit

Imports-West
Temperature

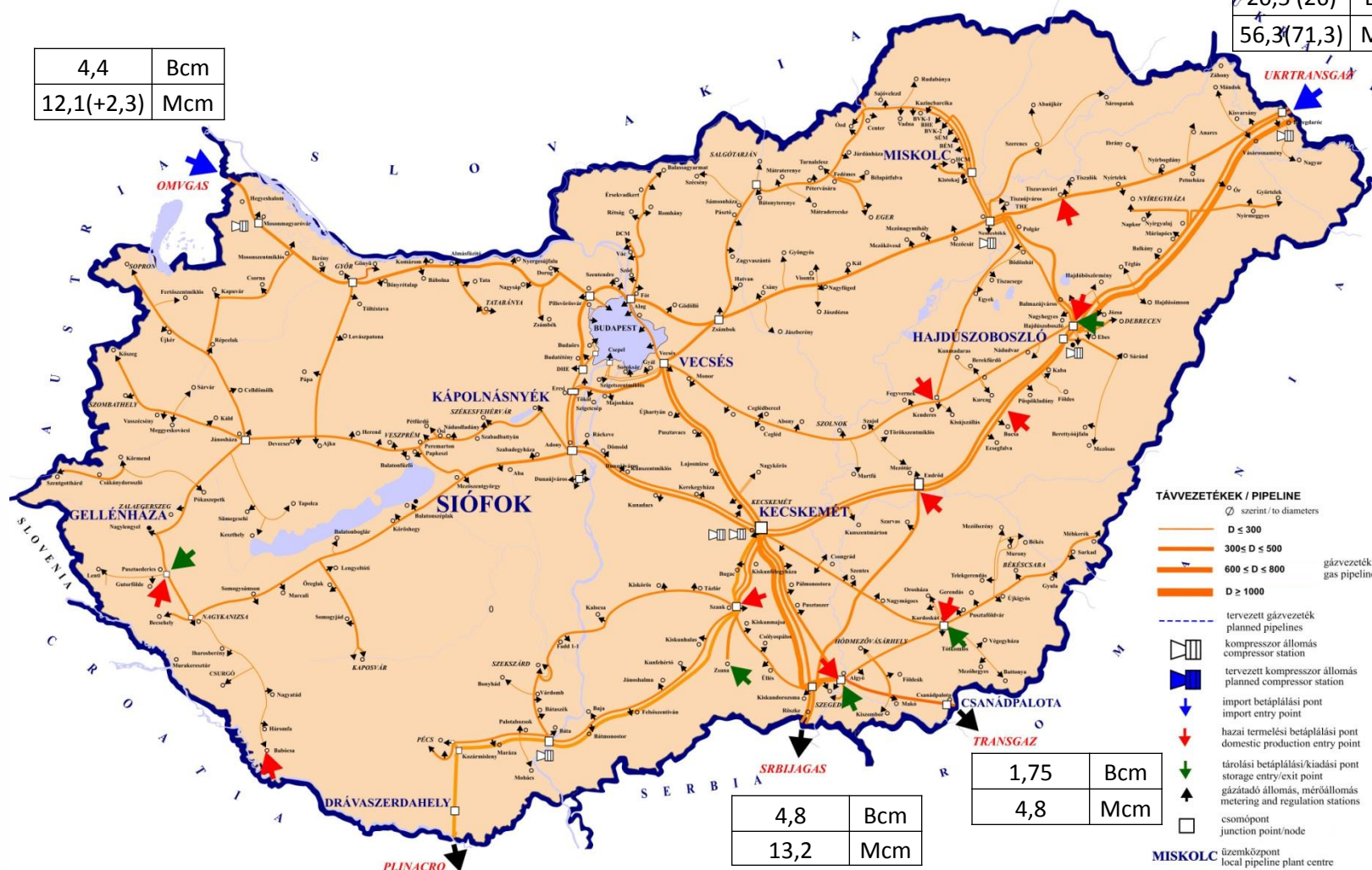
Underground Storage

Source: HEO

Existing transmission system

4,4	Bcm
12,1(+2,3)	Mcm

20,5 (26)	Bcm
56,3(71,3)	Mcm



6,5	Bcm
19,2	Mcm

4,8	Bcm
13,2	Mcm

1,75	Bcm
4,8	Mcm

Development in Transmission

Transmission interconnection capacities

- **HAG (western import)** 12.1 Million m³/day (4.42 Bcm/year)
- **Brotherhood (Russian import)** 56.3 Million m³/day (20.5 Bcm/year)
+ 12 Million m³/day transit (4.38 Bcm/year)
- **Romanian Interconnector (operated since July 2010)**
4.8 Million m³/day (1.75 Bcm/year)
→ 12.0 Million m³/day (4.4 Bcm/year)
- **Croatian Interconnector (operated since March 2011)**
19.1 Million m³/ day (6.5 Bcm/year)
- **Slovakian Interconnector (project just started)**
6 Million m³/ day (2.2 Bcm/year)
→ 14.4 Million m³/day (5.3 Bcm/year)

Strategic Storage

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

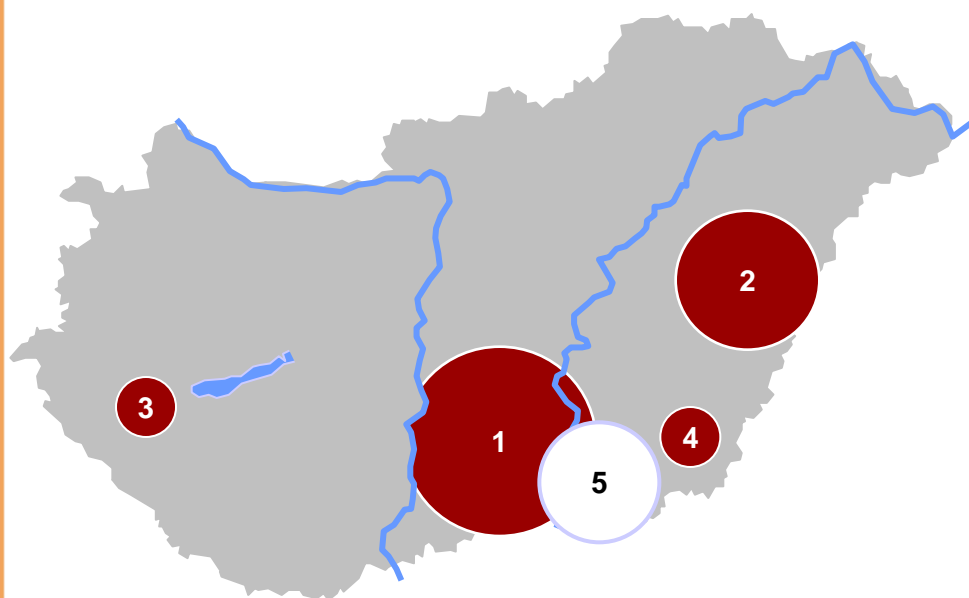
- A new strategic storage facility had been constructed until 1 January 2010 (Algyó gas-field, at the Szőreg-I layer in Southern Hungary)
- Working gas capacity: **1.2 billion m³**
- Withdrawal capacity: **20 Million m³/d** (for min. 45 days)
- For the exclusive supply of household and communal consumers

In the same facility MOL 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 Capacities 2012

Storage Capacities



● E.ON commercial storage units

○ Strategic (Security) storage unit

Storage Unit	Working gas capacities [MMm ³]	Peak withdrawal capacities [MMm ³ /d]
1 Zsana	2 170	28.0
2 Hajdúszoboszló	1 440	20.8
3 Puszttaederics	340	3.1
4 Kardoskút	280	3.2
5 Strategic UGS Szőreg-I.	1 200	20.0
Szőreg-I. commercial	700	5.0

TOTAL 6130 80.1

Total injection capacity: 45.9 MMm³/day

Total Capacities of the Gas Network [MMm³/day]

Domestic Production	10.5
IMPORT Western (HAG)	12.1
IMPORT Eastern (Brotherhood)	56.3
Romanian interconnector	4.8
Croatian interconnector	19.1
STORAGE	80.1
- Commercial UGS	60.1
- Strategic UGS	20.0
TOTAL	182.9*



*** Enough to cover winter daily consumption down to -17 °C daily average temperature (no need to interrupt)**

Thank you for your kind attention!

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